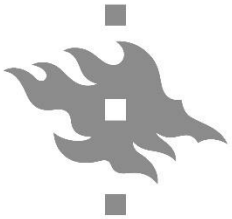


Master's thesis
Geography
Human & urban geography and spatial planning

Geographical Aspects on Deep Transitions and Global Governance for Sustainability

William Smolander

2019

Supervisors:
Professor Sami Moisio
Associate professor Pia Bäcklund

UNIVERSITY OF HELSINKI
FACULTY OF SCIENCE
DEPARTMENT OF GEOSCIENCES AND GEOGRAPHY
GEOGRAPHY

P. O. Box 64 (Gustaf Hällströmin katu 2)
00014 University of Helsinki

HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

Tiedekunta/Osasto Fakultet/Sektion – Faculty Faculty of Science	Laitos/Institution– Department Department of Geosciences and Geography	
Tekijä/Författare – Author Dan William Smolander		
Työn nimi / Arbetets titel – Title Geographical Aspects on Deep Transitions and Global Governance for Sustainability		
Oppiaine /Läroämne – Subject Human & urban geography and spatial planning		
Työn laji/Arbetets art – Level Master's thesis	Aika/Datum – Month and year 11/2019	Sivumäärä/ Sidoantal – Number of pages 86

Tiivistelmä/Referat – Abstract

A growing number of researchers, including geographers, have under the last decades become interested in sustainability transitions. This thesis highlights the connections between geography and transitions in three ways: by critically analysing current models, by developing the geographical approach to transitions and by introducing methodological approaches for further studies.

I go through three models that try to explain transitions, but choose to focus on the deep transition framework that describes establishment of meta-rules that steer long-term development beyond specific socio-technological systems and across spatial boundaries. This framework is however lacking a profound understanding of geography, which is why I go into how territories, places, scales and networks connect to transitions. I also discuss power as a geographical phenomenon and the governance of sustainability on a global level.

There are signs that the United Nation's vision of sustainability, has gained popularity in different institutions. I believe researchers should explore these signs further. Based on the theoretical framework, I show three different but complementary approaches for studying and interpreting strategies for societal development. I hope that the theoretical and methodological contributions this thesis gives will be utilized in further research on highlighting the connections between geography, sustainability, transitions and governance.

Avainsanat – Nyckelord – Keywords
Transitions, Sustainability, Governance, Geography, Development

Säilytyspaikka – Förvaringställe – Where deposited
HELDA

Muita tietoja – Övriga uppgifter – Additional information

Table of Contents

1 Introduction

The evident and growing need to change the way our established systems and our societies work has led both politicians, scholars, and every day people growing increasingly interested in sustainable development. However, what is this sustainability that society is becoming more aware of, where does the ideas stem from and how can transition patterns be tracked? Within the last decade, transitions have become a hot topic in research (Meadowcroft, 2011; Murphy, 2015; National Research Council, 1999; Sorrell, 2018). The goal with this thesis is to build a theoretical framework for understanding what a deep sustainable transition may comprehend and to take a closer look at what geography can bring to this field of research.

Transition is the concept of societal change that I focus on and stick to in this thesis; though similar to transformation, development and adaptation, it has its own theory (Feola, 2015). The terms etymological meaning is to go across, from one phase into another (Hölscher, Wittmayer, & Loorbach, 2018). In order to understand what it is that is supposed to go across; I take help of a term borrowed from the multi-level perspective, namely regimes. Fuenfschilling and Binz (2018) consider regimes to be rationalities or the rules of the game, that effect development in various ways. Transition studies can therefore in a most simplistic way be described as how a regime change over time and transition into a new form, where different practices and ideas become relevant. In this, transitions are more than technological advancement; they comprehend radical changes in policies, discourses, markets and institutions (Geels, 2010). Sustainability transitions are about understanding the process of achieving radical, sustainable and structural change from the current stabilized system into another. This is highly relevant in order to understand and tackle most of the global problems we are facing today. It is therefore not surprising that we have a growing research community that is interested in the theory, concepts and practices behind sustainability transitions (Feola, 2015; Hölscher, Wittmayer, & Loorbach, 2018). This thesis will also fit into this space of research.

To answer the needs sustainable development puts on transitions, I see a requirement to widen the concept and focus of transition studies. Sustainability transitions are, or at least should be, conscious, goal-based and inclusive of different aspects of society. The whole social order should change and adapt more sustainable rules to follow (Geels, 2011; Markard, Raven, & Truffer, 2012). In this thesis, I move away from a narrow focus on transitions, where only specific socio-technical systems are considered. Instead, I view sustainable development as a

deep transition, a substantial change of rules and paradigms that will affect the development trajectories of many socio-technological systems (Schot & Kanger, 2018). This means that I will look at transition processes beyond transitions of regimes, and more into how meta-regimes transition into new forms. I believe this shift in scope and focus is essential when thinking about sustainability on a global level.

My main focus will be on the geographical aspects of this deep transition. It seems logical that sustainability transitions would interest geographers, as processes associated to societal change are both spatial and temporal. The context in which transitions take place should be equally interesting as the historical development. Still it is only quite recent this interest has risen, and it seems to have come with vengeance (Coenen, Benneworth, & Truffer, 2012; Coenen & Truffer, 2012; Hansen & Coenen, 2015; Murphy, 2015; Truffer, Murphy, & Raven, 2015). Many geographical viewpoints on transitions are possible and I will try to highlight some of these throughout the thesis.

Studies and contributions by geographers to the sustainability transition discourse has to this point mainly been about criticizing existing models, stressing the importance of geography and developing the spatial framework for transition studies. One way of tackling the problems of one-dimensional spatial viewpoints on transitions is the adaptation of a multi-scalar approach (Truffer et al., 2015), to identify that different processes are linked between many scales simultaneously. Fuenfschilling and Binz (2018) on the other hand point out the importance of studying how dominant regime structures, and the rationalities and rules behind them, are diffusing in space through networks. At the same time, researchers should understand the role of power structures and the socio-spatial embedding when ideas and niche technologies start to align and become part of an existing regime (Murphy, 2015). By identifying these geographical viewpoints, we can see that it is not enough to consider one socio-spatial relation at a time (Jessop, Brenner, & Jones, 2008; Leitner, Sheppard, & Sziarto, 2008). In order to understand what a geographical understanding can bring to transitions, we need a holistic understanding of spatial relations and their interconnectedness. I will for example use the TPSN framework, how the socio-spatial dimensions of territories, scales, networks and places interact (Jessop et al., 2008), when I treat geographical aspects of transitions in this thesis.

My goal with this thesis is to bridge geography, sustainability and transitions. I will do this in three ways. First, I will look critically at the concept of transitions and analyse how existing

models treat geography. I will also explain why the concepts of transitions should be widened in order to explain sustainability and changes across different societal sectors and in different places. Second, I will show how different socio-spatial theories, including the TPSN-framework as well as geographical notions on power, can and should be connected to transition studies. This also connects to the discussion on why a geographically nuanced understanding of transitions is needed for the governance of sustainable development. Last, I will show three different but supplementary approaches for studying geographical aspects of transitions.

I have divided my thesis into two parts. In the first part, I discuss the first and second goal of my thesis. I build a theoretical framework for a holistic understanding of the topics discussed, what is said about sustainability transitions, what models are used to describe transitions and how geography is essential in transition studies. By the end of part one, I have built theoretical framework for understanding how geography is connected to deep transitions and the global governance for sustainability. In the second part of this thesis, I will mainly show how analyzing strategies regarding societal development can give insights on the current deep transition. I chose to focus on the geographical aspects of current governance practices that seek to align societal strategies on different scales into a more coherent direction. I also seek to show how researchers can read spatial conceptions of the people behind the documents, how do they understand and use place, scale, territories and networks? Furthermore, I will treat the methodological interest of understanding the internal geography behind a document. In what ways are a document like Agenda 2030 spatial, and who is truly behind the ideas presented in it? In the discussion and conclusions, I focus on what type of geographic understanding this thesis has brought to the discussion of deep transitions and I look at opportunities for further research that may get to answer if we are transitioning into a greener future.

Part I

The forming of a Theoretical Framework

2 Sustainability Transitions

In the face of today's escalating problems regarding dwindling resources, growing segregation, climate change, waste management and much more, a societal need has risen to change existing systems, and ways of functioning, to a new direction. Research has played a large role in the sustainability discussion and is actively forming and reforming the comprehension of the current situation as well as what need to change and the methods to do so (Kates, R. W., Parris, & Leiserowitz, 2005). Not only have this led to shifting interests in more conventional disciplines, but new disciplines have arisen, and cross disciplinary research is more common than ever. This in turn have led to many different methodologies and terminologies passing over to the study of sustainability (Feola, 2015). Feola identifies different concepts that have emerged under this umbrella interest of social and environmental change, for example transition, transformation, adaptation and development. These all overlap in some ways, but as they are unique in their nuances, it would be good for researchers to keep to one concept and define what it means for them. The concept I chose to highlight in this thesis is transitions.

Transition studies resonate closely to sustainability science as both of them try to provide relevant and usable data and to come up with solutions for pressing problems (Komiyama & Takeuchi, 2006). By understanding and identifying different pathways for societal change and the mechanisms behind the process, it is possible to analyze where we are now, identifying possibilities for where we are going, as well as recognize different events we may encounter on our way. The concept of transitions can therefore function as a tool for identify the path we should take to achieve a specified desirable outcome. This is valuable for achieving sustainability and it is no wonder transition studies have taken an important role in the academic discussion of sustainability. Today we can identify a whole research community that is devoted to study sustainability transitions and transition theory (Feola, 2015; Hölscher et al., 2018). This thesis will fit into this space of research.

Developing an understanding of the world as an earth system with planetary boundaries that should not be crossed is essential global governance for sustainability (Nilsson & Persson, 2012). This earth system can be divided into sub systems that in turn consist of different interlinked socio-technical systems with unique development patterns dependent on both time and space. To this point, transition studies are mainly used for these specific socio-technical systems, sectors of our societal infrastructure, and identifying their historical development (Markard et al., 2012). Systems that fulfill a certain important societal function are for example the energy sector, water management, transportation, housing or agriculture. The shift from only analyzing technological development to recognizing the need to identify technologies relations and meanings to society have played an important role for innovation studies (Geels, 2004). Grin et al. (2010) do however recommend that research should go further than this, they stress that sustainable development and therefore transitions on sustainability should be treated in an holistic manner that include all aspects of the world. To help with this conceptualization sustainability is often divided into an environmental, economic and socio-cultural dimension.

The overall goal of this part of the thesis is to provide an overview of what sustainability transitions are and how the conceptualization of them can be developed by introducing geographical aspects to the discussion. First, I discuss sustainability, what it is said to be and how it can be categorized. From this general discussion, I move on to the concept of transitions, what the concept mean and their use in research. Different models for transition studies exist and they all have their uses when studying the development of socio-technical systems. I will discuss the multi-level perspective as well as techno economic paradigms. Regarding sustainable development, we should however see society as a whole and therefore in the end I focus on the framework for deep transitions (Schot & Kanger, 2018). Academic development for a deeper understanding has occurred in the past decades and today transition studies are a central part of studying sustainable development (Markard et al., 2012; National Research Council, 1999).

2.1 Sustainability - a Goal for Societal Development

Sustainable development, as defined by the Brundtland commission 1987, is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). The concept of sustainability has since been processed and re-thought numerous times, partly due to that past and current efforts have not been a

satisfactory in governing sustainable development. The contribution by Brundtland's report has for example been said to be vague, pragmatic and even contradictive (Jordan, 2008). Maybe the point of the document was not to give us a definite answer, but to set fire on the debate on the relationship between humans and their environment (Sneddon, Howarth, & Norgaard, 2006). Academia has been especially involved in the development, and sustainability has since the Brundtland's definition been identified through goals, values, indicators and through practices (Kates, R. W. et al., 2005) or even as a social movement (Fischer, 2000).

Sustainability is however hard to define in a way that would be exclusive and acquire consensus throughout academia and in society. Maybe this is good, as some are afraid it would divide instead of aligning political action (Jordan, 2008). By having a loose and abstract definition of sustainability a variety of different interpretations of controversial topics may fit under one commonly accepted focus (Häikiö & Leino, 2014). It is better to be united loosely than doing nothing at all. The flexibility also let the concept grow and change according to need (Kates, R. W. et al., 2005). Development is highly contextualized and have both a temporal and spatial dimension, so what we think is sustainable in the developed countries might be of low priority in for example the so-called global south. What in society should be kept as it is and what should be developed? These are questions of power and priorities, which lead to the conclusion that sustainable development in the end is a political construct (Komiyama & Takeuchi, 2006). How sustainability is defined and understood will therefore vary by time, place and the actors involved. This can lead to vague and insufficient actions on a global level and for the future. For example, it is not uncommon that decisions that should be made according to what is best for the future are made on the term of office, in the hope of reelection (Lundqvist, 2004). We can however see a growing willingness, maybe due to the growing and pressing need, to do something for the future.

Even though sustainable development is hard to pin point, it is important to maintain some key principles so that the idea of sustainability cannot be changed according to actor's own ideas and values, which would lead to the concept losing its meaning (Kates, R. W. et al., 2005). Jordan (2008) chimes in on this and agrees that governance is needed to achieve sufficient consensus between many competing and in times opposing interest. Despite the continuation of the debate on sustainability and development more generally, it is generally recognized that sustainability should tackle problems, encompassing the social, economic and environmental dimensions. A central debatable problem is connected to the interplay of these dimensions,

which often are in conflict with each other (Campbell, 1999). The debate circulate around which dimension should be prioritized, as it would be naïve to believe that we truly can sustain a perfect balance between different interests. This leads to a choice, to make sacrifices in some part of the earth system to sustain other parts (Nilsson & Persson, 2012). Even though these concerns exist, we can already see some kind of formation of consensus regarding the need to do something about the way we are heading and for a need to build a comprehensive worldview instead of individual fragmental understanding of the world (Sneddon et al., 2006).

To achieve the comprehensive worldview Sneddon et al talks about, a reform of the economic system and coherence of policies is needed (Biermann et al., 2012). I will discuss this in connection to governance for sustainability. In the second part of this thesis, I will also show how analyzing strategies for societal development can give insights on this topic. The key idea concerns alignment versus disjointedness between local strategies for municipal development, national strategies and Agenda 2030 as a global strategy for sustainable development. Through this analysis, it is possible to identify signs on whether global governance on sustainability has been successful in its local implementation, but also how the movements of these ideas and policies have spread geographically. Eventually, with enough empirical studies, it may be possible to identify whether or not a new meta-regime has emerged. With meta-regimes Schot and Kanger (2018) mean rule-sets that go across different spatialities and different sectors of society. If this is the case, is the transition sustainability oriented? Before going ahead of myself into the interesting topic of the connections between geography, transitions and sustainability, I need to discuss in more detail what transitions are.

2.2 Characteristics of a Sustainability Transition

Before going more into depth on models that describe transitions in different ways, I will briefly go through the basic characteristics of transitions identified by Grin, Rotmans and Schot (2010, 11-12). To their list of characteristics, I include remarks that I found from other literature sources. I believe this helps with orienting transition studies to sustainability, and prepares for a more detailed explanation. All the characteristics can be found in Table 1, at the end of this chapter.

Firstly, Grin et al. (2010) point out that transitions are about radical change, that the scope of change is evident, and that the direction of change leads to something different than before. It

is a co-evolution process, which means that many aspects of the socio-technical system are undergoing change. Hölscher et al. (2018) identifies these changes to be complex and non-linear. Secondly, transitions are comprehensive in a way that they include not only technical development but they involve community changes and therefore the analysis goes into organizational fields (Grin, Rotmans, & Schot, 2010). Traditionally the concept of transition has been used for describing changes in socio-technical systems, such as energy or transportation systems (Fuenfschilling & Binz, 2018), but today we can also see the use of transitions for describing broader societal change (Hölscher et al., 2018; Schot & Kanger, 2018). This is especially important when talking about sustainability transitions that often are multi-dimensional and occur on a macro-level (Geels, 2011)

Grin et al. (2010) continue down their characteristics list to describe transitions as processes that bring together social groups, businesses, policymakers etc., which all play a role in the transition process. However, through the process of going across there may be other non-human factors that promote change and those that hinder it from happening. This is why researchers should consider both material and non-material actors in the networks behind transitions (Murphy, 2015). For example, established power structures, regulation and institutions can have a substantial effect on different outcomes. Identifying the actors that have most potential to steer the direction of the transition gives the researcher something to focus on in their studies.

The final characteristic by (Grin et al., 2010) is connected to the temporal aspects of transitions. When conceptualizing transitions we are looking at long-term processes. To achieve relative stability an innovation must mature and that can take up to 50 years. This period is considerably longer if we are treating sustainability as a deep transition as the process that change value systems and even cultures need to undergo many smaller socio-technical regime transitions (Schot & Kanger, 2018). Sustainable development, as thought of today, might therefore look completely different in the future when technology, practices and science evolve. This shows that historical analyses can be made on specific technical innovations and development, but also on the deeper mindsets behind development today and if they have changed from ideals identified earlier, for example from economic growth and profits (Perez, 2013).

Geels (2011) identifies two additional characteristics that especially concern sustainability transitions. First, we go away from the idea that transitions always happen in favor of the most economically effective or the technologically most efficient solution. We are talking about

altruistic development, for the common good. Second, sustainability transitions always have a purpose to lead transitions into a path towards a more sustainable future. One of the reasons former initiatives and governance of transitions has failed is the lack of a clear goal (Loorbach & Rotmans, 2006).

Another important characteristic that remain unnoticed by both Geels (2011) and Grin et al. (2010), at least in their listings, is that even if time and the historical development is important we should also see that geography will influence the characteristics of the transition (Truffer et al., 2015). Spatiality has too long been unrecognized in transition studies or then geography has been naively covered (Coenen & Truffer, 2012). Unique places with unique combination of power will most certainly play in on how societal change is felt and seen (Allen, 2003). Adding a spatial dimension to the temporal lead us to the conclusion that transitions should be understood as spatiotemporal processes. Later I will undergo a more detailed discussion on this spatial aspect of transitions as this is important in understanding the architecture of the earth system governance (Biermann et al., 2009). For now, I want to build on the conception on how transitions are conceptualized in research. I will do that by employing the terminology of the so-called multi-level perspective (MLP) popularly used for describing transitions.

Table 1. Main characteristics for transitions, additions that especially concerns sustainability transitions are marked with green.

Characteristics of Sustainability Transitions							
Complex and non-linear systems	Radical change both in scope and direction	Altruistic approach / multi-dimensional development	Macro-level development focused on global concerns	Networks of human and non-human actors/ unique power structures	Long-term process / important temporal aspect	Processes bound to different spatial contexts	Goal oriented / serving a purpose

3 Understanding Transitions Through Models

Models can be used to simplify our world that is complex, interlinked and hard to grasp. By seeing the world as an earth system comprising of socio-technical systems makes it easier to identify change and therefore to govern (Biermann et al., 2009). This makes models essential tools in transition studies, especially concerning sustainability, as researchers need to understand comprehensive and extensive transitions (Smith, Voß, & Grin, 2010). Models make it easier to understand real world problems, but as they simplify and generalize one should be critical and reflexive when using them when facing problems in the real world. Anyhow, transition models describe theoretically how transitions happen, what factors and actors play in and how future development may proceed.

To date, transition research has focused on further development of existing and new models for analyzing transitions. Some influential models developed throughout the years are the multi-level perspective (MLP), Techno-economic paradigm framework (TEP) and Technological-Information systems (TIS). The different frameworks and models for studying transitions, have all contributed to research on the topic. In the span of this thesis I cannot treat every model equally as they all have different approaches and concepts, but also benefits and drawbacks in how they treat transitions in socio-technical systems. Because my main interest is sustainability as a new paradigm for global development, I am interested in the deep transition framework developed by Schot and Kanger (2018). Deep transitions affect many socio-technical systems simultaneously and in different spatialities. I chose this model because it combines the multilevel perspective with the techno-economic paradigm framework and because it will consequently give a deeper understanding of the earth system, which is essential for understanding sustainability (Wiek, Withycombe, & Redman, 2011).

In the following sections, my goal is to form a comprehensive understanding on how transitions occur by the use of models. Before I go in depth on the deep transition model, I will develop the idea of transitions by using one of the most influential models for describing transitions, the multi-level perspective. This will add to the basic characteristics treated earlier and will provide a general understanding on how radical societal change may happen in socio-technical systems.

3.1 Multi-level Perspective

No text on sustainability transitions seems to be complete without at least a mention on the multi-level perspective (MLP). First formed by (Rip & Kemp, 1998) as a model for technological change, it has affected how transitions are analyzed today more generally. The model has been developed and refined through the years, from describing how innovations compete and strive for a dominating position at the market to societal change. One of the main forces behind the development is Frank Geels who has treated technological transitions trough the MLP for over a decade (Geels, 2005; Geels, 2010; Geels, 2011). Aspects of the original model are still present, but it seems to have gotten a wider meaning as well as scope of analysis. The model is for example is no longer only for analyzing socio-technical systems as closed environments. The MLP provides a way for researchers to look at the process on how transitions take form, mainly by describing how the situation look at a certain time, at a specific scale and for a specific socio-technical system (Grin et al., 2010).

The MLP come down to three main components: the regime, the landscape and the niche. These were formerly thought as geographical levels, nested hierarchies that were treated vertically. The landscape pictured global development and ideals while niches described local innovations. Scholars has especially criticized this aspect of the MLP as using geography in a naïve way (Geels, 2011). As a response, Geels says that these levels should be treated as "heterogeneous configurations of increasing stability" where the landscape is most stable (2010, 495). This indicate that the landscape is the hardest to change, while niches are transient.

Going into more detail on the components of the MLP I start with the landscape. Global and universal trends form a stable social configuration that is active on a macro level. The landscape is connected to things like the global political climate and trends like globalization, sustainable development and capitalism. The landscape can also represent different external shocks to the system, for example natural disasters, wars or economic crises that can accelerate transitions or alter their trajectories (Loorbach & Rotmans, 2006).

The socio-technical regime is on the other hand operated and formed at the meso-level of activity. Regimes are described as relatively stable structures within a specific section of our society, a collection of shared practices, ideas and rules on what technologies and innovations are accepted within the specific socio-technic system (Fuenfschilling & Binz, 2018). Even

though regimes seem homogenous, they also have internal variations, which is why Geels (2010) describes them as semi-coherent rule-sets. In addition to the more abstract rules and worldview, regimes may also represent a material form of transitions, like established infrastructures, actor-networks and dominant innovations that form a setting for further development. Throughout this thesis, I will however see regimes more as semi-coherent rule-sets that form some kind of institutional rationality for development.

The last main component in the MLP are niches which are multiple and unstable small-scale developments in either technologies, practices, ideas or rules (Geels, 2010). Niches first operate in protected environments, sheltered from the outside market. From a vantage point, they try to push through and compete their way up from the micro level of activity to become a stable feature on the meso-level regime or even affect the landscape.

What the multi-level perspective in its core tries to explain is how a niche transitions into a regime or become part of it. Points of interests include how the regime with its existing practices and structures act as hindrance for new technologies to blossom and how the seemingly external landscape affects the overall development by giving openings for niches to affect the regime (Smith et al., 2010). Even though this process seems hierarchical and simple, researchers should be aware of the complexity of the real world. When the MLP first was developed, the landscape was external to the other levels, but now it is identified that regimes also affect the landscape, for example the communication regimes effect on globalization (Smith et al., 2010). This shows a more balanced geographical viewpoint; the landscape consists of a series of spatially bound activities. For example, it is important to recognize that niche innovations that traditionally represents the micro level of activity, local innovations, can also develop simultaneously on a global scale. This way niches may directly affect the landscape; the MLP model does not however explain through which socio-spatial relations this happens. Another thing that is important to recognize is that innovations can also form inside regimes as they try to stay relevant in a changing context. Due to above-mentioned reasons, we should identify that transitions occur through more complex processes than simply from the niche up (Geels, 2011). These processes are spatially bound, which is why a geographical perspective should be taken.

Alignment is a key concept for describing the processes in the MLP; it describes how rules and practices are becoming coherent in different contexts. Focus is on how niches either modify themselves or how they are forcefully translated into a form that is compatible with the existing

regime (Murphy, 2015). New rules and innovations are more easily adapted if they are familiar and fit in with the existing institutional rationality i.e. the regime. The regimes stabilizing effect stems from the process of institutionalization of formal and informal rules and practices of a system (Fuenfschilling & Binz, 2018). To become relevant, penetrate the regime, it might be easier to modify and align with the regime to be part of semi-coherent rule-set (Geels, 2011). Therefore, fast radical changes in regimes are unlikely. Transitions are processes that develop in small steps, innovations adapt to the regime, but at the same time, they slightly change the direction of the transition. Of course, there are also niches that does not undergo a modification process. They will however have a harder time of breaking through and become mainstream, mainly due to the hindering nature of the regime. If niches are persistent and take the opportunities the external landscape gives, we can see that regimes themselves start to modify in order to keep relevant, as they too have to answer to the pressures the landscape put on them. After the initial hindrance of the regime, the regime may even become an enabling factor (Grin et al., 2010). This leads to the point that even if these change cycles may take many decades, they can be radical in their scope. With time, it is possible for niches to establish a new alternative socio-technical regime.

Because of interdependencies between the landscape, regime and niche, as well as the need for alignment, transitions may be forced into a situation where only one path is available. These situations are lock-ins as the transition becomes locked to one trajectory (Grin et al., 2010). Other possible alternatives may be totally excluded, or they may become irrelevant due to factors like cost and efficacy. Lock-ins may form inside regimes due to established infrastructures, favorable policies, investment patterns or simply the lack of technical solutions (Geels, 2010). Lock-in situations can however also be identified when taking a wider focus, from a specific regime to the interlinked web of socio-technical systems. As an example, many different regimes are dependent on non-renewable sources for energy. Even if there are other alternatives for energy production, they do not have the potential to overthrow the nuclear dependent energy sector or the oil dependent transport regime (Späth & Rohracher, 2010). Until the energy sector comes out of its lock-in situation, other systems, like transportation, are all due to follow a specific, non-ecological, trajectory. In order to solve such lock-in situations it is important for researchers to localize and recognize them in the first place.

The prevailing regimes and connected actors are important factors in how niches succeed. This leads to the notion of power in regards to the MLP and more generally for transition studies

(Geels, 2011; Truffer et al., 2015). Identifying power structures is essential for understanding why some niches succeed and some do not (Geels, 2011). Scholars should be interested in who the people behind change are and through what ways they influence transitions trajectories. The multi-level perspective can be used as a tool for finding the actors and groups that are essential in the transition process (Whitmarsh, 2012). At the same time researchers' focus on power structures within transitions, the dynamics between regimes and niches becomes clear. Ultimately, this can lead to an understanding why transitions occur as they do, different in various contexts. The power discussion is something I found the literature on MLP currently does not consider in high detail.

The multi-level perspective cannot answer all problems, which all the criticism geared towards the MLP seem to expect from it (Geels, 2011). For example, it is questionable if the MLP and other positivist approaches can describe a world that is complex and prone to interpretation (Sorrell, 2018). A model is only a simplification of reality, and therefore it cannot incorporate all social, economic, or political theories. For me, this model gives a start to tackle the more ambiguous task of understanding sustainability transition on a grand scale. The MLP will therefore be part of my understanding of transitions. Even if it is not feasible to expect any model to be all-encompassing, I believe some aspects of the MLP can be built upon, for example regarding dynamicity and spatial understanding. As a geographer, Murphy (2015) for example stresses the point that meaningful connections only happen when niches align with the given geographical and temporal context. There is not a universally coherent and stable regime, as the multi-level perspective may suggest, it varies dependent on its spatio-temporal dimensions. In my thesis, I seek to develop a geographical perspective of transitions and in doing so I hope to provide a broader understanding on societal change. These are also important factors to develop in order to understand how a deep sustainable transition might take form.

3.2 Techno Economic Paradigm Development in a Nutshell

I will now introduce the second model that together with the multi-level perspective form Schot and Kangers understanding of deep transitions (2018). Going through both models allow me to use some of the key ideas and terms used later on in this thesis. Generally, the Techno-economic paradigm (TEP) is a model that seek to show how aggregated processes, the capitalist economy and the socioeconomic system have developed over time (Perez, 1983). For this purpose, Perez divide the capitalism system into two subcategories: a techno-economic and a social and

institutional system. The change process is faster in the technological side of the economic development, but in the end, technological advances also influence how society is organized. For example, the increased need for white-collar workers due to technological advancements did lead to renewal of the school system and increase in higher education (Perez, 1983). In this thesis I am interested in these connections between rules, technology and societal values, especially how values and ideas of sustainability may lead to societal change.

When analyzing the co-development of technology and society we are looking at what Perez calls a great-surge (Perez, 2007) or what Schot and Kanger (2018) would call a deep transition. The techno-economic paradigm can be used to describe the process surges goes through. The focus is on a vast time-period that reaches hundreds of years; many studies go all the way back to the beginning of the industrial revolution. Perez (1983) thought that structural changes in the economy comes in surges, which she based on the Kondratiev waves. These surges, that last for about five to six decades are central for explaining changes in techno-economic paradigms. Different modes of development can be identified from one peak of a surge to the next. Each surge is based on how new innovations and practices are becoming increasingly important due to pressing needs to change. Openings for new practices may rise when existing practices are being unprofitable or when they have reached their maximum potential (Perez, 2003).

Perez (2003, 47-60) identifies that surges go through an installation period and a deployment period. The first period consists of an irruption phase where innovations or clusters of innovations are being developed and adapted in the market. This leads into a frenzy phase within which more and more actors in the society are taking part of the innovation. As the name suggest, it is a time of rapid growth. With time, this frenzy slows down and development is heading for a time of synergy. This also indicate moving from the installation period to the deployment period. At this point in the process, society start to complement the existing paradigm (Perez, 1983; Rip & Kemp, 1998). The first phase of the deployment period is characterized as a time of synergy, the golden age of an innovation, where ideas and practices are adapted by different societal sectors and they get support of the existing institutions. This synergy phase seems to me closely related to what Murphy (2015) and Geels (2010) mean by alignment in the multi-level perspective; technologies fit in with the existing regime and the regime start supporting the new niches. When most societal actors have adapted to the technologies introduced in a surge the process goes into a maturity phase of the deployment period (Perez, 2003). The maturity phase ends when new problems emerge or when profitability

decreases. Now we are in the middle of a break point, on the top of a surge. From this point onwards, the cycle repeats itself, new ideas start to form and we see a move towards new practices (Perez, 2007).

The TEP introduces an important explaining factor on how transitions are more than changes in specific socio-technical regimes. For one, it shows that technological development affects larger societal development and values. It also shows the temporal process through which ideas and values change. The explanation this model give on long-term societal change is of course generalized. For example, changes often are not abrupt and different surges can coexist for quite a long time. The TEP also has a problem with explaining why these changes occur. The focus is mainly on the internal development of the market and new technologies while exogenous explanations are missing (Schot & Kanger, 2018).

Geographical insights are also something that this TEP lack or at least it seems to treat this aspect in a superficial way by only focusing on national and international scale of development. According to Schot and Kanger (2018), it would be important to introduce a multi-scalar approach to this model. As I will later describe, this may not be enough as we have other socio-spatial relations that are important in their own right. Things to consider are the networks between actors on different scales, to identify how the socio-spatial embedding affects societal change and how existing power structures play a role in the transition process. Some of parts of the TEP Schot and Kanger (2018) improves in the deep transition framework, while I consider the geographical aspects in more detail.

4 Conceptualizing a Sustainable Deep Transition

Up to this point, my focus has been on building an understanding about the core concepts of my thesis: what transitions are how they function and how they connect to sustainable development. Researchers who want to be part of the sustainability science community should try to seek some common ground across different disciplines. Generally, research for sustainability should try to understand and influence the future; it should consider solutions to complex and wicked problems as well as strive to develop a broad understanding of how different systems work together (Kates, Robert W. et al., 2001; Willamo et al., 2018). Kates et al. (2001) also stress the need to understand the spatial aspects of the phenomena that is studied.

Although their recommendation is arguably narrow, focusing on integration between scales, the idea seem right. Flowingly, I will identify how the concept of deep transition brings the field of transition studies closer to these considerations of sustainability.

I believe transitions as a concept has the potential to be a tool that explain societal change holistically. The multi-level perspective provides researchers with an idea on how different aspects of our societies, namely niches, regimes and landscapes, affect societal transition (Geels, 2002). The division in three levels is good in that it let the researcher look at each independently but still forming a picture. The MLP is especially useful for understanding specific sectors in detail, what technologies are advanced, how do a specific regime promote or hinder change through regulation etc. The scope of the study will however remain quite narrow, focused on singular socio-technical systems. If interdependence and complexity are in the heart of our sustainability issues, we should ask ourselves if this is enough. When talking about large questions of sustainability we cannot be restricted to some specific compartment of reality. The issues at hand are interdisciplinary, linked and complex, they do not respect geographical boarders and their timespan is vast (Trent & Chavis, 2009). By saying this, I do not mean that researches should stop focusing on specific socio-technical regimes; they should, as details are important. However, I put emphasis on the fact that the research community also needs to understand how large and deep societal change occur and develop tools for achieving change.

Therefore, in order to achieve a broader understanding of transitions in this thesis, which after all is about sustainability transitions, I need to extend the scope of the multi-level perspective but narrow down and increase the spatial focus in the techno economic paradigm. Today there seems to be a consensus that all different sub-systems and socio-technical systems have to start to align in order to reach sustainability (Nilsson & Persson, 2012). Transitions are starting to get recognition beyond socio-technical systems, that transitions may reflect the whole society and that they can take a global character (Fuenfschilling & Binz, 2018; Schot & Kanger, 2018). This is good, as transitions, in its original use, did not allow for a deeper understanding of how interlinked large-scale processes are (Hölscher et al., 2018). By identifying the larger picture and understanding connections, it is possible to use transitions as a concept for describing the process where society moves from one societal order into another (Geels, 2011).

Broadening and diversifying the perspective should also be connected to the different dimensions of development. Because transitions originally described technical development,

many studies have been focusing on technology in relation to the environment (Rip & Kemp, 1998). The techno-economic paradigm on the other hand focuses on the economic aspects of long-time societal change in addition to the possibilities new technology brings (Perez, 2003). However, when considering sustainability, it becomes increasingly important to see how these transitions answer the needs of the social, ecological as well as the economic aspects of development. Sustainability transitions should therefore be viewed from a multi-disciplinary perspective, to be understood through literature and viewpoints from different schools and traditions (Murphy, 2015). For instance, sociologists and anthropologists have pointed out that transitions should not be analyzed without considering what the transition means for the society and different cultures (Kampelmann, Kaethler, & Hill, 2018). By taking different viewpoints on transitions, it is possible to identify unique characteristics and to find meaningful solutions that promote different interest. This results in a broader understanding of sustainability in socio-technical transitions.

A competence needed for sustainability is to identify and even predict future changes (Wiek et al., 2011). This competence connects to the dynamicity in transition models. Even though the processes of societal transitions are dynamic, models like the multi-level perspective are static. At best, the MLP give a description of the situation, a snapshot on a phase of the interdependent transition process (Grin et al., 2010). To answer the need for dynamicity, how variations, connections and alignment happen with time, it is important to include a conceptualization on how transitions proceed. The techno-economic paradigm is quite useful for explaining and predicting based on past experiences how trajectories may develop (Schot & Kanger, 2018).

In addition to the multi-dimensional aspects of sustainable development and the importance of temporal recognition, I argue that research should also include geography as a main element when widening the perspective for studying sustainability transitions. In order to achieve sustainability we need to recognize through what networks and scales transitions are formed and mediated. If the Techno-economic paradigm gave dynamicity to the multi-level perspective, this interaction between scales is something that the MLP introduces to the TEP, which traditionally analyzes change as something that takes place independently of context (Perez, 2003). We should however go away from what Fuenfschilling and Binz (2018) calls methodological nationalism, which is something that many studies using the MLP can be criticized of. There are many other socio-spatial relations to consider beside national territories. To identify networks is a step in the right direction for developing an understanding why

transitions look either the same or why they are altered by context (Amin, 2002). Scale is also of importance when analyzing how the global and local meet (Geels, 2011). The embedding of the place and unique power structures are in turn greatly important for alignment processes (Murphy, 2015). I will discuss these geographical viewpoints of transitions in more detail later, as both the MLP and the TEP lacks a deep understanding of spatiality. In this thesis, this will also be my contribution to the transition studies.

I believe it is important to incorporate all above-mentioned aspects of sustainability science into transitions models if we truly want to understand the bigger picture regarding a sustainable deep transition and how it can be governed. To repeat, it is important to understand that researchers cannot only look at one socio-technical system at a time as these systems are interlinked in complex ways. Second, we should put different aspects of development into consideration, green technical development is not enough. This point is also connected to the idea of a multidisciplinary approach regarding understanding transitions in their complexity but also in the details (Willamo et al., 2018). Third, the existing multi-level perspective model need more flexibility and dynamicity in order to better suit reality and in order to predict future development. Lastly, we should identify geography as an important factor for both understanding and describing the processes behind transitions.

In the ensuing pages, up until part two, I will develop these four aspects of the transition theory and show how the scope and comprehensiveness of transition studies can be developed. First, I introduce a relatively new way of looking at transitions through the framework of deep transitions developed by Schot and Kanger (2018). The model goes through the process of widening the multi-level perspective into a tool for analyzing time variations and it lifts the focus to rules and mentalities behind societal change, instead of only looking at independent technological advances. The deep transition framework is however lacking a well-developed geographical approach for explaining the importance of recognizing different socio-spatial relations when pursuing societal change. I will therefore refine the model by looking at the meaning of different socio-spatial relations, the role of the spatial embedding for alignment processes and how power can be used in achieving change. To conclude this part of the thesis I will look at the connections between deep transitions and governance of sustainable development, and what special indication the global space has for planning for a deep transition.

4.1 Deep Transitions Framework

As I argued before, sustainability is a broad, cross-sectoral and global phenomenon that cannot be compartmentalized into a specific system. To analyze sustainability in its fullness, it should be considered as a new type of rule-set and mentality that is broadly distributed in many socio-technical systems. Rules play a central role in Schot and Kanger's (2018) reasoning on transitions. Behind everything in our society, we can find rules that function as retention or enabling mechanisms for our behavior. As Allen (2003) would say by limiting the possibilities for action, a specific course of action is achieved. In this, we see the connections to transitions trajectories; dependent on the rules present we can expect different outcomes. Rules have different capabilities in both scope and systemicity. By this, Schot and Kanger (2018) mean that rules can vary from being single rules for specific systems to clustered rule-sets broadly distributed in many systems.

When widening the analysis of transitional patterns the focus is shifting from what Scot and Kanger (2018) call rules, mechanisms that are singular and present in one system, to regimes which are clustering of rules in a single system. This is close to the MLP definition of regimes as semi-coherent rule-sets, different ideals, ideas and technologies in a socio-technical system (Geels, 2011). Sorrell (2018) suggests treating sociotechnical systems and regimes as one of the same, as socio-material relations affect what rules are present. However, the model of deep transition by Scot and Kanger (2018) is also moving towards analyzing the "meta", something that defines ideas present in many systems. Because of this, I do feel that it is clearer to keep rules and regimes separate from the more concrete material systems. An example of a meta-rule could for example be the increasing demand of using renewable energy in different but interlinked socio-technical systems. With time, external and internal processes will lead different parts of society and different places to a common standard of development based on these meta-rules. Regimes will hence eventually show shared characteristics and become part of the meta-regime. The meta-regime is a cluster of meta-rules within many different socio-technical regimes; this is the focus for deep transitions studies, which are about analyzing standards for macro-level development (Scot and Kanger, 2018). An example of a current meta-regime is mass consumption, as it is the mechanism behind development of different industries and technologies.

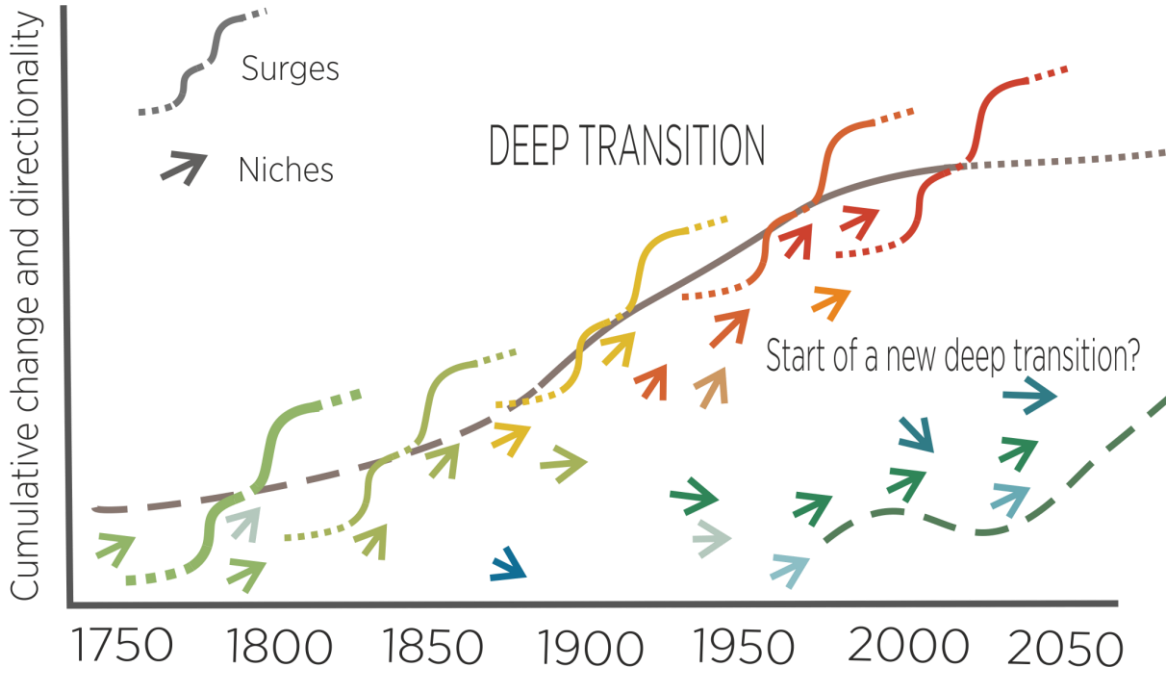
The deep transition framework was made for analyzing how meta-regimes are born and how different meta-regime development patterns are forming a general long-term direction for development, i.e. a deep transition. The formation of a deep transition is not a uniform and one-way process; it varies in scope, durability and direction (Schot and Kanger, 2018). Rules are formed and adapted or deflected in the interlinked but contextualized earth system. Power structures, resources, actor networks, technologies but also existing socio-technical systems and different spatio-temporal factors will all influence which rules are accepted and followed. This makes analyzing deep transitions complex.

Schot and Kanger (2018) utilize many ideas presented in the multi-level perspective (MLP) to describe progressive surges, which in turn they base on the techno-economic paradigm (TEP). This decision let them get the best aspects of respective model, but keeping it clear enough for the model to be understandable. TEP explains wide and long-term developments in technology and economy, which will have an effect on societal patterns (Perez, 1983). This process relates to the formation of meta-regimes. MLP on the other hand describes in more detail the factors and processes affecting transitions. Even if the MLP is static, it explains how external factors, described as the landscape, affects great surges and long-term development. This is something the TEP lacks, but that is important to recognize. For example, climate change will have a big push factor for technological advancement, but it will also put pressure on the economy as it is now. Alignment processes in the MLP is also an important mechanism for successful implementation of rules into larger societal contexts (Murphy, 2015). As Murphy stresses it is no longer solely the historical alignment between regimes, but also how regimes adapt to different contexts that is interesting for transition research. Together the models give a flexible understanding on how transitions are affected by the interplay of niches, regimes and the landscape, but also how history and place plays in and forms what is to come.

Explaining the process of deep transitions is about how rules become meta-regimes. Before the installation period of a surge, there are different niches that exist parallelly in protected bubbles and there is small to no coordination between them (Schot & Kanger, 2018). The landscape gives opportunities but may also hinder niches and rules to advance. There are both endogenous and exogenous processes in work, things like power structures, resources and technology, the political climate as well as different crises. In the irruption phase of the installation period, some rules and niches break through. These rules are considered useful in the unique context. Rules and niches start to align with each other and new rule-sets are taking form. In other words,

competing regimes emerge. Simultaneously some rules may also start to make broader connections and become meta-rules, single rules in different socio-technical systems. The process is now in what Perez (2003) would call the frenzy phase; there is rapid development and high competition between rules and regimes. There is no clear direction regarding which regime will become dominant and a variety of meta-regimes is possible.

As history show, there will be some kind of turning point, where the installation period is moving on into a deployment period (Schot & Kanger, 2018). Some meta-rules are successful in penetrating different sectors of the society. Frenzy becomes synergy as society and institutions are starting to favor a general rule-set, for example through standardization processes. The development of a meta-regime is now in its end phases, a set of meta-rules are affecting different parts of the earth system. The meta-regime will have a homogenizing effect on the direction of development; the direction of the deep transition is established (Picture 1). The existing deep transition that started in the early period of industrialization has now undergone at least five successive surges that have undermined a general directionality towards economic growth through production and consumption (Perez, 2015).



Picture 1. The timespan and directionality of deep transitions. Note how niches compete and become part of surges that form new regimes. Picture redrawn from Schot and Kanger (2018, 1055).

Contrary to the techno-economic paradigm, the deep transition framework notices the possibility for old meta-regimes to still be relevant throughout the process as well as in the start of the new deep transition period (Schot & Kanger, 2018). In the maturity phase, there will however be a dominant meta-regime, which gives directionality to the transition. Because of alignment processes, the direction will most likely be somewhat similar to the past transitions (Murphy, 2015). Deep transitions can therefore be described as a "series of connected and sustained fundamental transformations of a wide range of socio-technical systems in a similar direction*"* (Schot & Kanger, 2018, 1055).

As meta-regimes in their late stages of maturity cannot answer the pressures put on them by the landscape, opportunities for new niches and rules arise (Schot & Kanger, 2018). The process starts from the "beginning", still affected by what has been. Throughout the deep transition process, alternative niches and rules are constantly formed in their protected environments and the breakthrough of these are dependent on the openings endogenous and exogenous processes give. Today opportunities for change could for example be raised awareness of the environment, threats of environmental disasters, pollution, overpopulation, litter and climate change (Smith et al., 2010). Social problems connected to the capitalism development, like social justice, inequalities and a growing gap between the rich and the poor, also play a role in forming the overall development (Sassen, 2013). In a globalizing world, we may furthermore expect ideals and cosmologies other than western to become relevant in shaping the future global development (Sahlins, 1994). These points indicate changes in the landscape where meta-regimes are being formed; this can lead to a variety of technologies and rules that differs from the current meta-regime.

If radically different niches and rules become successful in forming a new meta-regime, for example through governance of standardization, it is not impossible that a completely new directionality can be achieved. Perez (2013) analyze that we may already be at a breakpoint between mayor shifts in our society. Information technology is combined with green growth and we can see some signs of decoupling between growth and resources. More studies are needed in order to identify whether or not we are in the starting phases of what we may call a sustainable deep transition or if the existing deep transition trajectory still is supported by the dominant meta-regime of mass consumption and production.

The broadening of transitions in order to describe sustainability is almost complete, but the ideas of deep transitions raised by Schot and Kanger (2018) could really benefit from a geographic perspective. Both models used in the deep transition framework have a weak approach to geography. The TEP treats societal change from the idea of a global opportunity set (Fuenfschilling & Truffer, 2016) and even though the MLP introduces some geographical aspects to the deep transition framework it is mainly focused on the interplay between regime and niche levels, how local ideas can become global (Whitmarsh, 2012). Overall, Schot and Kanger (2018) does mention the need of a multi-scalar approach, but it all ends up quite narrow. In developing a sophisticated understanding of the socio-spatial characteristics of transitions we need to find a balance between different spatialities, a scalar approach is not enough (Leitner et al., 2008). One would for example need to understand how the socio-spatial embedding and unique power structures affect development of local places, which in the end are what constitute "the global" (Truffer et al., 2015). Therefore, in order to broaden the understanding of transitions further and despite the risk of increasing complexity Sorrell warns for (2018), I now turn to combine the viewpoints of deep transitions with geographical aspects.

5 Bringing Geography into Transition Studies

Advances in communication technology, better transport networks and increased cultural connections, all connect to the idea of globalization. Processes like these seem to affect all aspects of our society, making them more homogenous. Though there have been constant voices from the beginning, pointing out that a globalized world does not mean the end of geography, it became frequent to dismiss the importance of space in societal discourses (Amin, 2002). Scholars seemed to consider that technology, ideas, governmental practices, cultures and even power can move without friction across space (Allen, 2003). To think about space in these terms have affected the study of societal change, which of course include transition studies. The area of interest in transition studies was on the historical and future development, and time became the main parameter for explaining and tracking change. This focus is evident in early readings about societal change or technological development, described in models like the much-used techno-economic paradigm or in the multi-level perspective (Geels, 2005; Perez, 2003; Rip & Kemp, 1998). However, it is of importance to understand that phenomena like multilevel governance and inter-linked global connections are not equal to a "lack of geographical specificity" (Fuenfschilling & Binz, 2018).

Professionals, mainly geographers or researchers with geographic interest, started to ask themselves if it is enough to look at societal change from one dimension (Coenen & Truffer, 2012). Are transitions going through the same processes in different contexts? The answer to this question is both yes and no. We can see similar transition patterns in different places and on a global scale (Fuenfschilling & Binz, 2018), but on the other hand transitions are also identified to spread unevenly across space, adaptation varies and unexpected turns in the transition pathways may occur. Effects and consequences of sustainability challenges are also place specific. The situation is clearly more complex than first expected. This led me to dive deeper into the geography of transitions and to ask questions like why do transitions look familiar in some places and on the other hand why do transitions succeed in some places where in other they do not?

As (Fuenfschilling & Binz, 2018) point out, geographers seem to want to identify differences, when at the same time the institutionalists are searching for similarities. There seems to be a need to look at the gap between the institutionalist approach and the geographic approach, to identify meaningful networks that forms transitions. Because meta-regimes only are semi-coherent rule-sets that exist in many socio-technical regimes, I think it is likely that there are distinct contextual differences in how deep transition take form. These differences are important to recognize, as I believe they will provide to be opportunities in the practical implementation on sustainable development. As already noted in 1992, when forming agenda 21, the big picture of global development will be formed by local places (Lafferty & Eckerberg, 2013). In order to change the global situation, we would therefore need to align local transition trajectories to a similar sustainable direction. At the same time, it is important to identify meanings and social connections that are present, and tailor-make development strategies for a high success rate.

As of now, the connection between geography and transition studies is mainly about developing the spatial aspects of the study framework. A goal is to understand how the context affects the overall transition process, which include the scope, speed and direction of development (Coenen & Truffer, 2012). There are still quite few empirical researches on the subject, but this field of research is growing rapidly. One of my main goals with this thesis is to develop the geographical aspects of the deep transition framework by (Schot & Kanger, 2018). By doing this I connect geography and transitions, but I will also bridge this understanding to why geography is an important aspect to recognize in global governance. My contribution to geography in transitions is also methodological; I want to show how analyzing strategies for

development can highlight the role of geography in transition studies. In the second part of this thesis, I will for example show how document analysis can be used for identifying variations in how well the United Nation's view on sustainability in Agenda 2030 has spread to different countries and to different localities. Concerning the treatment of geography in empirical studies Truffer et al. (2015) singles out three important conceptual dimensions that should be included: the socio-spatial embedding, a multi-scalar approach and questions of power. It is through these three spatial aspects of transitions I develop the deep-transition framework with a broader understanding on how sustainability transitions may vary dependent on context.

5.1 Scale, or What Socio-spatial Relation?

Truffer et al. (2015) focus on scale as the spatial dimension for understanding transitions. This might seem like a leap backwards, as the paradigm or spatial turn shifted from the ideas of scale and rescaling to networks already for well over a decade ago (Brenner, 2001; Jessop et al., 2008). Scale has however seemed to stay as the dominant dimension of spatiality when talking about earth systems and in transition studies (Biermann et al., 2009; Loorbach & Rotmans, 2006; Schot & Kanger, 2018; Truffer et al., 2015). This might have something to do with the multi-level perspective, as it treats activities on micro, meso and macro level (Geels, 2011). In this part, I ask myself if scale, even when treated in a complex and multi-scalar manner, is enough for understanding the geography of transitions.

My understanding of socio-spatial relations has to a great degree been affected by the TPSN framework developed by Jessop, Jones and Brenner (2008) which says that when studying socio-spatial relations, we should look at it holistically; territories, place, scale and networks should not be studied separately (Table 2). In addition to these dimensions, it is possible to add things like locality, mobility and positionality (Leitner et al., 2008). The important notion both make is that spatial dimensions are relationally bound to each other and by reflecting on a phenomenon from multiple dimensions, the situation can be understood in a more holistic fashion. According to Jessop et al. (2008), it is however possible to focus only on one dimension, but it requires reflexivity of the researcher and understanding that the narrow focus is only a specific contribution to a wider discussion. Because transitions are social processes, that are wide and comprehensive, I state that favoring one dimension of socio-spatial relations is questionable in transitions studies.

By widening the multi-scalar approach favored in transition studies and adapting the TPSN framework I believe we get a better understanding on how context matter for a transition's direction, timespan and scope. By saying this, I do not mean a multi-scalar approach is bad, it is indeed better than looking at scale in a simple fashion. I just believe it is as "wrong" as just taking a network perspective when analyzing global relations, like Amin (2002) does. For example to understand how different policies, or rules more generally, adapt to places we need to recognize the existence of policy territories that are unique and separate from each other (Prince, 2017). I will not systematically place my observations according to the TPSN framework throughout this thesis, but the framework is essential for the geographic understanding I present. This is why I will go deeper on what these socio-spatial relations might have to do with the framework for deep transitions.

Table 2. Describing why different socio-spatial relations are relevant in transition studies, following the dimensions in the TPSN framework by Jessop et al. (2008).

TPSN and Transitions		
Socio-spatial relation	Function in itself	Influence on transitions
Territory	Shaping boundaries and forming units	Administrative units have unique laws and regulations, i.e. rules. These shape the possibilities for transitions by functioning as barriers or drivers. Territories are useful for studying transitions.
Place	Generating horizontal differentiation	History, culture, actors, power structures, industries etc. affect what type of transitions are accepted and wanted in a place. Transitions will most likely be modified to fit the socio-spatial embedding, which in turn creates uneven opportunities for niches to settle in place.
Scale	Generating vertical differentiation	Local, regional, national and global entities are in constant synergy. Actors can be active on different scales depending on purpose. Activities need to be aligned across scales in order to shape a common directionality for transitions.
Network	Creating connections and dependency	Niches, actors, materials and power flow through different networks and influence the directions of transitions in various places, scales and territories. The connector of the other socio-spatial relations.

5.1.1 Scale

Scale is about identifying clusters of activities that are distributed to a specific spatial scale, traditionally in a local, national and global (Leitner et al., 2008). The discussions within transitions studies have developed from the binary global-local divide into a conception of multi-scalar processes.

In a multi-scalar approach, these scales are interacting with each other and are no longer seen as hierarchical, from the bottom up. Niches and rules are recognized to be able to cross and jump over scales, or even develop at different scales simultaneously (Coenen & Truffer, 2012). Multi-scalarity also refers to governance and power arrangements. Rescaling is a concept connected to this multi-scalar approach, which has been used to describe how the state modifies its organization in order to stay relevant and be part of supra-national forms of activity (Brenner, 2004). In transitions, I understand this rescaling as a way for niches to find the scale most relevant for their success. Therefore, what is achieved by looking at scale is more than a simplified understanding how innovations develop and move across space with time (Truffer et al., 2015). The simplified version is that different scales can be relevant at different times in the dynamic process of transitions. In the early stages of the transition process, the irruption phase of a cycle, local alignments might be most important for singular niche success. When the processes and innovations mature it is however important to shift focus from the local, to the regional, national and global, to see if and how the innovations are spreading (Truffer et al., 2015). This “scale-up” process if commonly thought of when treating sustainability related changes in societies (Trent & Chavis, 2009).

By adapting a multi-scalar approach, we can however see that the situation is not always this straightforward, niches can develop globally and then spread unevenly into the local scene, either directly or through the hierarchies (Coenen & Truffer, 2012). It is also possible to identify actors and activities that are connected to different scales and they may be active on various scales concurrently. This is what I expect for United Nations and Agenda 2030 as an innovation for sustainability transitions; the document is developed by local workgroups, to be a global norm or guide for sustainable development that again should be implemented locally. So, even if scale is important for observing transitions and their diffusion, I still feel that by looking at it by itself we lack a deeper explanation on the factors that are behind the transition processes.

Transitions and their scope and spatial reach is not just a matter of scaling up or down, they are as Truffer et al. (2015) says anchored in places.

5.1.2 Places

The dimension of place is strongly connected to the conceptual dimensions of power and the socio-spatial embedding; hence I only discuss this shortly here and more in depth later. A place creates horizontal differentiation (Jessop et al., 2008). Development of innovations are often bound to the possibilities a specific place gives them, it can be existing infrastructures, the capacity for mobilizing resources, the existing know-how or the power-dynamics. Some cities can for example due to their setting, as a financial, political or cultural center in the world system alter and manage transitions (Hodson & Marvin, 2010). The idea that the world is made up of places translates into transition studies as uneven opportunities for innovations to happen, some places may favor a specific path and constrain another. This raises a need for alignment between niches and rules to the context. Those that have the best fit to the existing circumstances also have the best chances of developing and spreading (Murphy, 2015). This dynamic, and the underlying forces behind it, cannot be seen by only focusing on scale, or for that matter on networks or territories.

5.1.3 Territories

Territories are closely related to places, but are stricter in their nature as they have clear boundaries that create inclusion and exclusion (Jessop et al., 2008). This divide creates topology between these spaces and are in this regard interesting for the movement of rules and policies (Prince, 2017). Consequently, they are also relevant to transition studies. Even though territories might seem to lose meaning in the processes of globalization, it is important not to dismiss the territory from transition studies. Despite the fact that various processes are increasingly networked, space is still to a great degree administrated through territorial units (Brenner, 2004). Rules and laws inside a territory will affect the trajectory of a transition. Territories are also a requirement for policy mobility to happen, but in my mind also for tracking the mobility of rules and other more technical niches. Without some type of boundaries, it would be impossible to see how political strategies are affected, by moving and adapting to different nationalities and places (Prince, 2017). Understanding the conditions and restrictions within a territory is essential for understanding why transition pathways may look different

between the administrative units that researchers incorporated in a study. Territories therefore help with identifying barriers and drivers (Johnstone & Newell, 2018).

These are reasons why, while scale became the favored socio-spatial dimension to look at for understanding transitions development and territories have had a large role in empirical comparative transition studies. The problem is that focus has mostly been on the state as the unit for observation (Ehnert et al., 2018; Späth & Rohracher, 2010). Moving away from this territorial nationalism or methodological nationalism approach is essential for empirical transition studies (Fuenfschilling & Binz, 2018). Geographers noted the importance of this already in the 1990s and was then given the catchy name "the territorial trap" (Agnew, 1994). In short, it means that researchers should not restrict analyzes on international relations and connections to the nation state, even if it provides a convenient statistical unit. The complexity and transboundary nature of sustainability related challenges also indicate that sustainability cannot only be analyzed through nations.

Despite this criticism, there are still voices that are in favor of the state as they mean it plays a large role in leading transitions to a sustainable direction (Johnstone & Newell, 2018). I believe both these notions are right, we cannot dismiss the state, but at the same time, we should be aware that we have more territorial boundaries than those made of nations; coalitions, municipals, trade zones etc. It is also important to note that these administrative units can be active on various scales (Brenner, 2004). Although territories are convenient for analyzing differences, they are quite stale in their nature and should be combined with something that gives more of a dynamic explanation to transitions. This does not mean that territories do not matter anymore, as I discussed above, they most certainly do. What we need is something to describe how ideas are formed and spread between territories, and even forming these.

5.1.4 Networks

We are not living in an age where geography is dead; in fact, the situation is quite the opposite, space become more important when the amount of spatial connections increases (Amin, 2002). This easily leads to a domination of a networked focus. Indeed, it is easy to combine places, territories and scales under the rubric of networks. Scales are formed through networked activities that are identified in clusters, places are formed and reformed through the flows that go across them, and territories are always relative to other territories through different relations

(Knox & Marston, 2015; Pierce, Martin, & Murphy, 2011). However, my point is not to take a network-centric view on transitions. I therefore think that Brenner's statement regarding scale also fits well for networks; "if the notion of geographical scale is extended unreflexively to demarcate any aspect of socio-spatial processes, then much of the analytical power and theoretical potential of recent methodological innovations may ultimately be lost, causing scale to collapse into an overgeneralized 'chaotic conception'" (Brenner, 2001, 593).

Previously I saw how networks play a role in the formation of scale, place and territories. However, this example did not give any real insights on what networks are. Therefore, it is also important to distinguish the differences between these socio-spatial dimensions. The socio-spatial dimensions should be embraced for their unique characteristics and researchers could use the interplay between the dimensions in order to understand the spatial phenomena more holistically (Leitner et al., 2008). By looking at networks by themselves, we see that they essentially are about transversal differentiation, making connections and dependency (Jessop et al., 2008). In this, networks are unique; they differ from scale, which creates vertical differentiation, places that create horizontal differences or territories that divides the world in units. I now move on to explaining why networks are interesting for transitions. Especially so, if we go from communication networks or infrastructural networks to the idea of topological networks where the meaning is more important.

Instead of proximity, researches can look at the type of relations exist between places, if it is far or close regarding ideological aspects (Allen, 2003). Networks have the ability to connect people and places, and are therefore essential for knowledge sharing and developing strategies and identities (Leitner et al., 2008). By doing so, networks are also affecting how things are perceived; we are going towards a specific adaptation of ideas that are common for those connected to a network (Wood, 2016). Consequently, this means that by identifying networks, and who belongs to them, we can start to understand why a transition is following a specific path (Coenen et al., 2012). Spatial development may actually be in the hands of these networks, comprising of individuals, policymakers, organizations and global firms, sharing ideas and models for production of space (Coe, Hess, Yeung, Dicken, & Henderson, 2004; Rapoport, 2015).

5.2 Socio-spatial Embedding

As promised, I will discuss the socio-spatial relation of place in more detail here. Socio-spatial embedding i.e. place is one of the three geographical aspects Truffer et al (2015) pledged us to treat when considering transitions. By treating this aspect in more detail, I hope it becomes clear why it is important to understand how a place is not only an empty container where transitions occur.

Place making, or framing, is a multi-scalar process where places are simultaneously global, regional and local depending on how we sense them (Pierce et al., 2011). Amin (2004) writes that the process of place making cannot be seen as spatial bound because we live and act in a globalized network society. Amin and Pierce are both focusing on the relational and networked aspects of place making. Considering other voices, researchers should not dismiss the unique character place has as a socio-spatial dimension (Jessop et al., 2008; Leitner et al., 2008; Murphy, 2015). As I argued before it is true that many processes are becoming more tightly knit to each other, and that the relationships between these are important. This does not mean that places change on a whim; places are connected to history, established actors and structures. Therefore they are not so easily changed as Amin let us believe when he says that places forms as different flows pauses for a short time in a specific locality before they move on (Amin, 2004).

The socio-spatial embedding affects transitions in at least two ways, by creating uneven opportunities for development and by the need of alignment between existing regimes and new emerging innovations (Murphy, 2015). Murphy stresses that we have different levels of contexts that all have their unique composition of embedded social practices. I will focus on the context of the landscape, regime and niches here, as this is familiar to the ideas discussed in the multi-level perspective and the deep transition framework. To repeat, the regime gives the preconditions and rule-sets of a place and niches try to become part of or even overthrow a regime. The landscape forms the wider context for this process. These may be on an ideological level in the multi-level perspective, but that does not mean the concepts have a spatial context (Coenen & Truffer, 2012). For niches to settle down in a specific context there needs to be some alignment between the preconditions of that place and the niches. A key point identified by Trent and Chavis (2009) for achieving sustainability in communities is the alignment of geographies as well as resources and interventions. A physical embedding is made through

localization of praxis, material, knowledge, values and more, which all in turn are dependent on the contextual regime. If alignment is off and the niche does not match with the socio-spatial embedding, the niche will probably be rejected from that spatial entity (Murphy, 2015). We are therefore left with a global grid of nodes or areas that express inclusion and exclusion of different things. This is why places are horizontal differentiators (Jessop et al., 2008).

It is important to move away from the naïve thinking of global opportunity sets in transition studies (Coenen & Truffer, 2012; Fuenfschilling & Binz, 2018). Instead, we should recognize the uneven opportunities places leave us. Murphy (2015) built a conceptualizing model on how alignment between technological innovations and niches are tested by the dominant regime. The two main factors considered in his conceptualization are the structural factors as well as the cognitive factors. These types of factors can be found both for niches, for regimes and for the landscape. Structural factors are those elements in our society that build norms or regulations, or what Murphy calls institutional patterns. Normative elements could for example be routines, expectations and roles while regulative elements are things like laws, rules, culture and the dominant market. In addition to the elementary structure of our society, we also have something that drives change and those that sustain the situation as it is. These can collectively be called cognitive factors, which in turn can be divided into representative elements like symbols, language and ontologies as well as into constitutive elements like motivations, objectives and choices. These elements can change suddenly, for example due to disasters or other extreme things in the landscape.

Murphy (2015) sees the interaction between different structural and cognitive factors as the main explanation on why various transitions patterns exits in different times and in different places. In addition to this, he also gives a detailed description on the importance of trust building and legitimization in this process. Legitimization comes with contextual overlapping, shared values and consensus. It is not uncommon that same actors or institutions are working with new innovations and at the same time representing the regime and context. This is positive for transitions as it gives higher levels of legitimization. For example, citizens might see that a municipal program for sustainable development is more legitimate than one made by foreign actors. Trust on the other hand refers to the confidence in new niches and in new ways of doing things. If new niches and rules do not seem trustworthy, or unfamiliar, they will probably not settle in place, or at least they will not radically change the existing regime (Murphy, 2015).

Considering the aspects Murphy points out (2015), I understand that for niches and rules to take root locally they need to be compatible with each other according to both structural and cognitive factors but in order to get adapted they also need to gain trust and legitimacy. I believe the same dynamic holds true if a local place wants to be suitable for global flows, which is something many cities strive for (Ward & Jonas, 2004). These processes are far from static, they are as temporally bound, as they are spatial. On that note, we can identify that places and the larger socio-spatial embedding is in constant change in order to answer landscape pressures (Hodson & Marvin, 2010). It is a relational process where the flows that tries to settle in place will have an effect that usually is modified according to the preconditions (Pierce et al., 2011). In other words, a place is made and remade through the ideas, material and power that goes through it (Allen, 2003). However the process is twofold and there are some relatively constant structures, place-frames, that can make places resistant for change. This is something I will go through in the next section, and it shows that understanding the socio-spatial embedding and its connection to transitions can be quite complex.

Contexts of the regime, landscape and niches need to align both temporally and spatially for opportunities for transitions to arise. By understanding how the cognitive and structural factors and their elements, that constitute the context, prevents or enables a transition to happen is essential for understanding how transitions function. Consequently, this knowledge is useful for directing transitions into a positive direction in distinct places (Truffer et al., 2015). Nevertheless, we are still missing an important factor in all of this, namely power. Understanding power help us to answer questions on how socio-spatial embedding are made or transformed and for what interest. I will now go into the last main geographical aspect Truffer et al. (2015) saw geographers should tackle.

5.3 Power

Truffer et al (2015) list power as an important factor for geographers to take into consideration when treating transitions. How rules become part of regimes or diffuse to become meta-rules is definitely a question of power (Schot & Kanger, 2018). The connections are of importance as the spatial contexts are formed by power, but power is also inherently spatial (Allen, 2003). Geographers have long been aware and interested in the imbalances produced through development of our societies (Truffer et al., 2015). The relations between geography and power can be studied on different scales, from cities and segregation to building cohesion in a region

and up to world politics, where one can analyze how different countries and cities are integrated to the global territorial system. What these have in common is that they are focusing on the socio-spatial features of these phenomena, how the social structures and power affects different places. What factors and which actors promote change and what hinder development? Why are we not living in a heterogenic world? Who wins and who loses? Moreover, by what means can actors affect development? These are questions that have been neglected but that should be included in transition studies (Hodson & Marvin, 2010; Murphy, 2015; Truffer et al., 2015). Therefore, I now go into what has been said about the topic of power and geography and why it can and should be connected to transition studies.

Power connects to the idea of achieving a desired effect, often but not always through the mobilization of resources (Allen, 2003). Hence, power cannot be separated from how its presence is felt, which means it cannot be reduced to a resource or a capacity held and possessed by certain people or institutions. Accordingly, Allen (2003) mentions that power is inherently spatial and temporal as the effect is always felt in a specific time and place. This also means that power is not uniform, it will not travel unchanged from one point to another, which some seem to believe. Regarding this thesis topic, it would be relevant to analyze variations in different administrative sustainability discourses. Is the focus on development dependent on place and those power structures embedded there? Alternatively, is it possible to identify semi-coherent rule-sets that are similar in different countries and in various places?

Previously I discussed the importance of the socio-spatial embedding for transitions in more detail, so now it is time to focus on the power aspects in the formation of the socio-spatial embedding and in territories. Power will of course also be involved in networks and scale, but I leave those aspects out for now and discuss them further regarding governance for sustainability. Pierce et al (2011) argues that a socio-spatial embedding, or more simply a place, is formed through a selection of material and practices that are directed to achieve specific ends. The place-frame can therefore show the goals and institutional structure for development at a specific time and place. As I said before the place-frame is relatively stable, the form it has is based on history, current power structures, livelihoods, cultures and much more. This forms a selection mechanism, a place-frame, for development. To what ends, the place-frame is used and who are behind the formation, is interesting when viewing power in relation to transitions.

In addition to the material aspects of a place, we have a variety of institutions and actors who all infuse their values to the place-frame. What is interesting is that some places have similar institutional structures, which suggests that place-frames can connect over spatial boundaries. Values and ideas connected to city-regionalism can for example be found in various cities (Jonas & Moisio, 2016). Place making should therefore be seen as a networked process where different interconnected actors and institutions from different scales can infuse their meanings to a specific place (Pierce et al., 2011). Actors may produce and reproduce meanings and therefore change the opportunities for flows of material and ideas to get adapted to a place (Allen, 2003). Different types of using power can be in play and the dominant view shows prevailing power structures. According to some network theories, a place is in constant flux and is always different depending on the unique combination of flows at that specific time (Amin, 2004). Still some place-frames, or at least elements of them, are more robust and lasting.

How lasting the place-frame is arguably a question on how deep-rooted existing power structures are. For example, a place-frame connected to a specific industry might not change that easily due to established actor networks, cultural values and material structures (Pierce et al., 2011). That said, a place is not isolated from broader transition process and as the landscape change, citizens, organizations etc. put pressure on the existing place-frame. Pressure for modification may for example be climate change or growing inequalities, as they affect what type of development is accepted by the society. In this, we can see the power of the commons, and how external events can affect these is interesting from a sustainability viewpoint. Widespread and effective communication may for example lead to sustainable change (Moser & Dilling, 2012). Communication and especially co-creation of place-frames can also be used for building trust and legitimacy, which is needed for new niches and rules to become part of the transition (Murphy, 2015). Modification of a place-frame can also be immanent, take place based on initiatives of local places. This is an aspect should not be forgotten when thinking of global change (Buijs et al., 2016). These initiatives are not always green, cities may for example want to connect to the global flows of ideas, capital, and resources in order to increase their competitiveness (Jonas & Moisio, 2016). This is a reason why many cities build place-frames that support innovation ports or good conditions for technological development.

As we have a variety of different viewpoints on development, the dominant view will belong to those who have the competence to mobilize resources for achieving their ends (Allen, 2003). Therefore, analyzing the place-frame is central in understanding power in transitions. Murphy

(2015) writes that management of the place-frame is an important part of the transition process, those that succeed in making a place and give it specific meanings also have the opportunity to choose between the visions and niches they believe should be connected to the frame and further development of that place. Study of these sometimes-hidden interests behind place-frames is interesting for transition studies.

It is apparent that the place-frame is set by different actors with different abilities to utilize power. These actors may artificially change the socio-spatial embedding where the unique combinations of actors, ideas, cultures, existing power structures and more influences the future of a place. Researchers therefore need to understand the ways in which the place-frame can be changed and through that affect the trajectory of a transition. Allen (2003) identifies different ways of exercising power, modalities of power, that all have unique spatial characteristics. Understanding power this way, is base for Allen's (2003) study of geographical aspects of power through the characteristics of proximity and reach. The modalities of power can for example be authority, domination and force. These are examples of instrumental power modalities that are used on someone's expense. All of them have great effect when there is high proximity but consequently these modalities do not have great reach, as they are dependent on close and immediate control. Power modalities can also be associative and co-working for a common desired effect (Allen, 2003). Examples of associative power modalities are suggestion, persuasion and negotiation. These in turn do not require immediate proximity as they are based on free will, which means the effect may not be immediate nor highly intense. However, in this lies their strength, they do not need surveillance nor control and can thus have wide reach. It is important to note that these modalities do not work alone; arrangements of different modalities of power build thick and diverse networks that will act out differently dependent on place (Allen, 2003).

As my goal with this thesis is to bring geography to transition studies, I have now focused on power in the formation and modification of the place-frame as well as the geographical aspects of different modalities of power. This does not mean that other, geographically interesting analyses of power could not take place in transition studies. For example, through examinations of power we might get to understand lock-in situations between different socio-technical systems their development and position in society. Probably most noticeable is the energy sector with its durable and important standing in development of different aspects of our societies (Späth & Rohracher, 2010). But, same questions can also be made for less dominant and

encompassing socio-technical regimes, for example power in relation to the role cow and milk industry in Finland. There are studies that show how specific policies and investments in infrastructures are made in order keep the development direction as it is. For example, the water sector in China seems to be organized in a way that focuses on financial gain, even if more sustainable alternatives could have been implemented (Fuenfschilling & Truffer, 2016).

By understanding power in a geographically nuanced way it is easier to understand how power is connected to geography and in turn to transition studies. The importance is probably most clear when thinking about restrictive or enabling effect power can have on which rules and niches are adapted to a specific socio-spatial embedding (Murphy, 2015). A geographical understanding is however also essential for understanding the modalities of power and getting the tools for steering transitions from afar. I will now take up on this thought and discuss more about global governance for sustainable development.

6 Sustainability as a Matter of Global Governance

To this point, I have gone through how transitions occur in our societies and why sustainability studies could benefit from the concept of deep transitions. The multi-level perspective, the techno economic paradigm as well as the deep transition framework help us understand the processes of transitions. However, what these models do not describe is how these new rules should be introduced in society. I believe geography can help with introducing this, by explaining how and why socio-spatial dimensions of deep transitions should be recognized and how the recognition of powers spatiality is connected to successful governance of the earth system.

In this section, before I go into the second part of my thesis, I discuss how a geographical understanding can be used when steering societal transitions towards a sustainable direction. To repeat myself, sustainability transitions are *conscious goal-based transition* where different aspects of society, the social order, change into and adapt more sustainable ways (Farla, Markard, Raven, & Coenen, 2012; Geels, 2011). In this definition, there is an underlying meaning of something that actively and consciously needs to be done to the current situation.

Different conceptualizations of transitions can be used for understanding the theoretical process a new sustainable deep transition needs to go through. The one I stand behind in this thesis is the deep transition framework by Schot and Kanger. However, I want to move beyond an understanding on how rules becomes part of meta-regimes and how these rules and niches should align with the socio-spatial embedding. If power connects to achieving an effect, what type of power can be used to develop and steer deep transitions into a sustainable direction? This is why I now connect transition studies and geography to governance.

6.1 Global Governance

Governing refers to purposeful acts to manage, control or steer the society (Jordan, 2008). Global governance implies more than state relations in an interstate system, and could be explained as purposive building a system of rule and the use of power in order to steer behavior of different actors at different geographical scales (Finkelstein, 1995). Governance merges from the practices of governing but is a concept for explaining how ruling is possible without a concrete government and without sovereign authority (Meadowcroft, 2011). When managing the world system focus should therefore not be restricted to the public regulative institutions and independent states; non-governmental organizations, political alliances and private firms should be recognized as part of this global network.

In more detail, governance of the earth system can be described as "the interrelated and increasingly integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society (from local to global) that are set up to steer societies towards preventing, mitigating, and adapting to global and local environmental change and, in particular, earth system transformation, within the normative context of sustainable development" (Biermann et al. 2012, 4).

Effectively Biermann et al. (2012) gives an explanation on the forming of a new sustainable meta-regime and there are connections to sustainability, geography as well as transitions. We see an emphasis on rules, how these are formed and how different rules supporting sustainability need to merge to form a meta-regime that can be implemented in rule-making systems at different geographies. This process will of course involve power in many ways. The explanation also points out the need for a multi-scalar approach, as the goal is to build strong networks between different actors active at different geographies. This binds together activities

for managing the world system. Because governing is not possible globally, governance is the way to set societal development on a transitional trajectory that is sustainable in the long run (Meadowcroft, 2011). These are the reasons why I use governance when talking about the steering of transitions into a deep sustainable transition.

6.2 Governance Toward Sustainability Transitions

The world system's current deep transition trajectory was set ca. 250 years ago, but it has proven to be an unsustainable direction and a brand new direction to follow is needed (Schot & Kanger, 2018). Governance of the earth system is not an easy task and radical immediate change can be hard to achieve. There are many different competing interests arguing about the direction of development even if sustainability transitions should be seen from an altruistic point of view (Geels, 2011). This is problematic as Smith et al. (2010) recognize direction, speed and mass to be key goals and evaluation basis for the success of a sustainability transition. I use the previous text on transition, and especially the framework of deep transitions, for explaining these three goals in more detail.

Starting with directionality, we need to know where we are at this point, where we come from and in what direction we are heading. In Biermann's et al. (2012) definition of governance of the earth system it says, that transformation should happen through the norms put up by sustainable development. It is in these norms we find purpose for transitions direction. However, as Smith et al. (2010) point out, the directionality is hard as we still have no real way of measure a "golden standard" for sustainability, how it is seen varies and translates to different circumstances. Sustainability is, thus, a politically contested concept with various meanings. Therefore, we should also question what view United Nations is mediating through Agenda 2030, who has decided what goals should be included and does this agenda actually reflect a "global consensus" on what sustainability is? Especially so when the Agenda is used as a guiding line for development, even at universities (Albareda-Tiana, Vidal-Raméntol, & Fernández-Morilla, 2018; Paletta & Bonoli, 2019).

Attempts in making a relatively well-developed direction for a global transition trajectory must be sensitive to the spatio-temporal character of transitions as well its non-linearity (Loorbach & Rotmans, 2006). Rules or more specifically norms are central for governing the earth system but also for the process of forming meta-regimes that are central for transitions (Biermann et

al., 2009; Schot & Kanger, 2018). Rules are not only restrictive, but they give an opportunity for actors to change the way the system works, and therefore rules are key elements in steering transitions (Smith et al., 2010). These rules must fit different places and be relevant in the future; the rules need to be optimized in order to fit territorial restrictions. This notion has led to an increasing focus on municipalities and other localities when analyzing and coming up with solutions for global issues (Graymore, Sipe, & Rickson, 2008; Lafferty & Eckerberg, 2013). At the same time, it is important to have a general and global direction that can be administered by one entity (Trent & Chavis, 2009). Solo efforts of a person, company, country or even a continent cannot tackle global problems that cross both spatial, temporal and disciplinary boundaries. The issue is how these two seemingly contrasting statements fit together, how to link the local, that constitute the mass, to coherent policies on a global level. By this statement we come to one of the key questions in this thesis, how can the understanding of a deep transition and its spatio-temporal character be used in global governance for sustainability?

I utilized the deep transition framework for developing an understanding on the transition process and what steps rules and niches need to go through before they can be part of the meta-regime and changing the system. This aspect connects to the speed aspect of sustainability transitions (Smith et al., 2010). Alignment processes with the socio-spatial context as well as the current regime is for example important in order for rules to be accepted as part of the system (Murphy, 2015). Even though transitions are long-term processes the speed of a transition could be accelerated through better alignment processes, both spatially and between different socio-technical systems. Avoiding lock-in situations where some aspects of the society depend on other ones are also connected to the speed of a transition.

The last element that Smiths et al. (2010) listed for successful transitions is to get a large mass behind the transition, to get different sectors and whole societies on board with the transition process. Societies have unique ways of dealing with decision-making based on different rules and values. Decisions, or at least the process behind decisions, can therefore be described as cultures (Nunn, 2012). These cultures are affected by vertical relationships, rules thought to us by our parents, but more interestingly for this thesis topic are historical circumstances and policies aimed to change the rules societies follow. How rules take place in our society, how they start forming meta-rules and how they finally make rule-sets in different parts of the earth system is an important notion one can take from the deep transition framework. Actors,

institutions and infrastructures need to support the new emergent meta-regime when heading into the deployment period (Perez, 2015; Schot & Kanger, 2018). So, in order for rules and practices connected to sustainability to become dominant there needs to be coordination work between different actors relevant for the transition. This work should be multi-scalar to combine global agendas to local cultures and through that get the mass to change. Loorbach and Rotmans (2006) identifies ways global institutions need to modify in order to be able to tackle wicked problems, but on the other hand there is also a need to reconsider the role local have in global affairs (Seyfang & Smith, 2007). Much of the needed transformative work happens in daily choices and therefore it is important to change the culture by which humans live (Buijs et al., 2016). I believe this is the challenge for activating the world population and gathering the mass towards a deep sustainable transition.

Within the vast and complex networks behind transitions, it is possible to identify power structures, instructions and actors that are actively forming individual cultures. For example education institutions seem to have an important role in the governance of sustainability (Barth & Timm, 2011; Findler, Schönherr, Lozano, Reider, & Martinuzzi, 2019; Sibbel, 2009). To identify key actors and target political attention on these could be key for making effective policies that steer direction of transitions in one direction as well as get the sufficient mass needed (Smith et al., 2010). Governance could also be used in changing the landscape, put pressure on actors that are acting in an unsustainable way and on the other hand invent rules that gives opportunities for actors to establish new practices. If consensus on common rule-sets cannot be achieved within the actor networks, there will be a negative effect on the mass and direction and therefore on the speed of the overall transition is subdued.

6.3 Power and Governance from a Distance

When understanding power equal to its effect (Allen, 2003), it becomes apparent that power is a central aspect in the processes of shifting transitional trajectories. Sustainable development asks for relative homogeneity between different places and scales, as there is a need of building a common fighting strategy for the grand problems our world is facing (Biermann et al., 2012). At the same time, we also have different cultures that affect how societies react and treat problems faced (Nunn, 2012). Thought should therefore be put on how power can be used, from a distance, to align place-frames and cultures that are distant and separate from each other.

A challenge for global governance regarding sustainability is to make various contextualized trajectories more coherent with each other but still allowing room for unique characteristics. Understanding power as inherently spatial makes an interesting notion on this challenge. Dealing with global problems, we are operating in a space that is cross boundary and transnational. Instrumental power modalities, hard planning or governing practices have little effect as we are working with a soft space (Haughton, Allmendinger, & Oosterlynck, 2013). According to the theory of Allen (2003), it is associative power modalities, like suggestion, seduction, persuasion, temptation, manipulation and negotiation that should be used for governance on a global scale.

There are many arguments for using associative power modalities when striving for sustainability, but using these might also be the only option. The institutions and actors involved in associative uses of power do not have to be institutionalized in society. The earth lacks a global government and a worldwide surveillance force that is present and that would enforce rules on everyone living here. Because the associative power modalities are based on free will, they do not require the same immediate proximity as for example force, authority or domination (Allen, 2003). These associative modalities of power are also enabling, empowering and co-creative, which all are important factors for building trust. Because of the freedom of choice, the use of power is able to be flexible and to overcome barriers regarding justification, trust and legitimacy. Trust is an important factor for successful adaptation of new niches and rules in localities (Murphy, 2015). It can be hard to achieve trust when rules and directions come from above with force, which is why it is important to use power in a way that is respectful and inclusive for the local. Policies and ideas that emerge from governance move gradually, unevenly or even irrationally towards governments in actual places. However, where they succeed they can alter local cultures and help them align towards a new common direction (Nunn, 2012). The local legislators and influencers do in turn have the tools and legitimacy to use more instrumental power modalities if needed. As long as the message is heard, it may be enough for governments to accept and give trust to foreign influences. How policies and ideas move from governance to governments, at various geographies, is therefore a “process of learning and exchange, which involves power and personalities” (Wood, 2016, 392).

Associative types of power are often exercised through soft planning, soft law and other governance methods that may for example conclude, recommendations, knowledge, statistics, strategies, goals and evaluation methods (Abbott & Snidal, 2000; Skjærseth, Stokke, &

Wettestad, 2006). These type of pacts, treaties or agreements are not binding legislatively but it does not mean they lack political significance. The use of soft law shows that policies, ideas and governance of these are adapted to strategies in many ways and that the learning and adopting of policies are not a one-time event, but it is a circular and complex process of information exchange. Not only can policies be a result from global processes, it is also through this type of policy processes globalization is produced (Moisio, Luukkonen, & Jonas, 2018). Through this information swap, wider changes in our societies may form in unexpected places. Now the question is if this approach to governing transitions is effective and for example is a set of global goals and guidelines enough for the ambitious undertakings needed to achieve sustainability? This idea will prove a central part of my suggested research approaches in part two of this thesis.

As with everything, there are two sides to a coin, and there are some problems regarding governance using associative power modalities and soft law more generally. One of the obvious problems it that of responsibility and obligations, there are no real and concrete sanctions for those who decide not to follow the agreement (Klabbers, 1998). The choice factor, which is good in establishing reach, may have a negative effect on the speed and mass of change that Smith et al. (2010) pointed out to be important for sustainability. Immediate nor sudden change is likely to happen, and we would have to rely on people's own choices in order to get the sufficient mass behind the transition. Distant problems, both spatially and temporally have a negative effect on motivation, which can lead to unwillingness or even resistance towards change. This is especially the case if the existing local culture is based on rules that are contradictory to those arguments and values introduced by an outsider (Nunn, 2012). In other words the alignment, which is needed for transitions, is hindered by the current place-frame that forms the direction for development of a socio-spatial embedding (Murphy, 2015).

If soft laws are not followed, it leads the conclusion that it is the same to have no law at all. Klabbers (1998) even go as far to say that soft law can have negative impact in situations where politicians and world leaders chose not to play their role in this "charade of norm-setting", as it may lead to uncertainty, unrest and lack in belief of the legal system. People are happy as long as there are norms, even if the development of norms do not have any real impact. Associative power modalities may according to the arguments of Klabbers (1998), have an overall negative impact on the intensity of the effect. This notion combined to the need to move away from incrementalism, short steps and long processes, make transitions processes seem too drawn out

and ineffective on pressing problems (Biermann et al., 2012). Geels (2010) also notes that making radical policies can be hard due to how the current political systems function, in that they usually react too late when the problems have become urgent and out of control. One could therefore argue for more active and dominant modalities of power, for example to use sanctions in order to get immediate effect for pressing problems in the earth system. The question is who would surveil this type of governance? In addition, even the problem of surveillance could be solved, we are faced with complex and ethical problems regarding the use of power over another, questions of responsibility and the right for development.

The conclusion therefore is that regardless of the weakness in soft law governance, we need efforts for building networks and together work for solutions, inside and outside academia (Sibbel, 2009; Wiek et al., 2011). Even if it might not be effective in the start, it might lead to a new more formal and effective form of governance for tracking and ultimately achieving sustainability. Soft law and hard law seems to be bonded in two main ways. Firstly, by complementing each other where they overlap and secondly in that soft law norms can through hard law institutions affect the implementation of these norms in society (Skjærseth et al., 2006). There are already some cultural-cognitive rationalities, in other words meta-rules or cultures, that are being institutionalized internationally (Fuenfschilling & Binz, 2018; Nunn, 2012; Schot & Kanger, 2018). I believe this is evidence that through establishing networks and using associative power modalities it is possible to establish new worldviews and technologies, meta-regimes, in places that are distant from each other.

Next, moving into part two of this thesis, I hope to shed light on this topic. I will show how researchers can recognize geographical aspects of deep transitions when analyzing strategies for societal development. Mainly I will focus on how the governance for sustainability that uses power modalities of suggestion and negotiation, seem to be able to cross-spatial, temporal and sectoral boundaries. Has current global governance been able to align various place-frames towards a global coherent trajectory towards sustainability?

Part II

Highlighting Geographical Aspects of Sustainability Transitions Through Strategies

In the first part of this thesis, I sought to introduce a theoretical framework for understanding how long-term sustainable development can be analyzed through the idea of alignment of multiple transitions in many interconnected socio-technological regimes. I argued on the many ways geography is connected to transitions and reasons why a spatial sensitive approach is important both for understanding transitions but also for governance of the earth system. In this part I want to show how and why geography should be noticed in empirical studies as well as why it is important not to only rely on one socio-spatial relation when analyzing complex problems, or worse yet, dismiss geography altogether.

One of the central problems for global governance is to achieve coherency in the directionality of local administrative forces. To implement sustainability to local governments was already a goal for the Agenda 21. Consequently, for example Sweden made a program called Local Agenda (Lundqvist, 2004) and later launched a Local Investment Programme for Ecological Sustainability (Baker & Eckerberg, 2007). The argument for establishing programs like these is that altering local imaginaries, values and activities eventually lead to changes that affect much larger areas. Global governance has therefore striven to implement a global semi-coherent directionality for development in various place-frames. If this governance is successful it allows for aligned transition trajectories, while still being respectful to the local and allowing room for adaptation according to contextual needs. But, has it been successful? I will now go through three different methodological approaches related to studying strategies that may highlight the role of geography in the alignment process of a deep sustainable transition.

The first approach I take to highlight geography in regards to sustainability transitions concerns the degree of implementation global policy for sustainability has aligned to local place-frames. Development of sustainability niches at grass root level, as well as adapting to global innovations locally, are important aspects of sustainability (Seyfang & Smith, 2007). This is also the approach I will discuss in detail my thesis. I chose to represent global governance for

sustainability by Agenda 2030, mainly because we lack another definition on sustainability that has gained as widespread recognition; countries, cities, corporate actors and universities etc. are all trying to adapt to the 17 goals presented in it (Albareda-Tiana et al., 2018; Dahlmann, Stubbs, Griggs, & Morrell, 2019; National report..., 2016). Agenda gives guidelines that can be adapted by local decision makers and through the document United Nations use power modalities that are based on free will and that allows variation in implementation. Based on my earlier arguments, this document seems to follow what I argued global policies should do in order to be implemented in local settings. Therefore, it is interesting, if not essential, to know if this type of soft law can make an institutional rationality that crosses both sectoral, spatial and temporal boundaries. Equally important is to know if this type of soft law is making governance less effective; too vague and blurry for it to have any effect (Klabbers, 1998). By analyzing various strategies and comparing them with each other and with the agenda, it might be possible to get insights if current sustainability governance is capable of breaking through the two-century old pattern of development and to make a completely distinct new meta-regime that will lead the way for a new deep sustainable transition.

However, we are quickly coming to the question of what a global document is and if such a thing even exists. This question leads to the second methodological question that I raise related to strategies and connected to geography. Geographers should ask themselves where the ideas presented in Agenda 2030 come from. What is global if it is always constituted and emerging from various localities? Who are the main actors behind the formation of the document, from which city and country do they come from, and what kind of viewpoint is taken? Who have had the most influence, and on the other hand, what views are left unnoticed? All of the questions relate to the internal geography of a document. By analyzing the internal geography, it is possible to understand the complex networks and power structures behind the formation of "global" governance.

The last approach I will shortly discuss connects to the mediated geographical understanding in a document. How do the writers and makers of a strategy understand geography, and what type of consequences can this have? My suggestion is that the same strategies that are used for answering the questions and topics I presented above, also should be evaluated using the TPSN-framework by (Jessop et al., 2008). This approach will give insights on whether societal development is comprehended as something connected to territories and places or if scale and networks are recognized in more detail. How do they identify and use their unique socio-spatial

embedding, and how does they see it in relation to the other socio-spatial relations? I believe these questions can have a big effect on what type of approaches to development these units take. For example, a country focusing on only their own territory may show a lack of understanding regarding their role as a player in a vast network and may therefore lack willingness to do anything about concerns that are not pressing for them.

Many of the questions I have raised are quite ambitious and complex, which is why it is important to note that the greater picture is formed in small pieces. In this thesis, I may only show how researchers can develop a deeper understanding on sustainability transitions through analyzing strategies. In other words, I will not be able to establish a comprehensive and accurate picture of how the situation. However, as Smith et al. (2010) mention, a debate about new methods for tracking and building a picture of the current situation is important for transitional research. If we truly are in a deep sustainable transition can only be speculated at this point, as extensive research still needs to be done. I still believe that this is an important research topic, which is why I want to be part of answering whether we are moving on to a new sustainable deep transition.

7 Strategies as Windows for Societal Development

In order to get a comprehensive picture of the societal state I stated that it is not enough to analyze the historical development of technical innovations. The concept of transitions need to be widened as they effect society in more profound ways; the social structuring including rules and values that will change over time due to technological advances (Perez, 1983). Because I chose to focus on governmentality and steering transitions towards a more sustainable direction, I want to highlight the existing mentality behind transitional patterns. What meta-regime lies behind current transition processes? To answer this, I think it is best to turn to different policies as they are made to steer development, whether small scale or on a grand level.

Policies are formed through social interaction and are represented either orally or textually (Freeman, 2012). I focus on textual documents as these are concrete and more accessible and could therefore be a great asset in studying transitions. This approach of tracking mobility of policies and knowledge in space can be called following the materials (Wood, 2016) or as Prince (2017) would call it, a methodological assemblage orientation. The idea is that objects,

documents, models or expert statements can be used to construct the collection of pieces the world is built of. Because the vastness of materials, I had to ask myself what type of document is best representing the mentality behind transitions. The problem with studying a specific policy is that they often represent single rules in different socio-technical systems or meta-rules that are present in different systems. Sustainable development requires a balance between different dimensions of our society. Sustainability should be incorporated into the way socio-technical systems work, not only from a material and from a technical point of view but as we are talking about societies, the meaning and values of sustainability transitions are equally important (Kampelmann et al., 2018). This means that we must move focus from single policy movement and implementation of new technologies in socio-technical systems to the broader societal structuring and the values connected to it. The backside of this increased complexity is the reduced workability, hence it becomes harder to understand and harder to adjust to empirical studies (Sorrell, 2018). Because I want to show the combined effect policies have on development, I needed something more comprehensive than single policies, something that show the meta-regime, those semi-coherent rulesets that affects the whole society. Based on Knights and Morgans (1991) notion that strategies are connected to epistemologies, I state that strategies may also be key documents in highlighting societal transitions.

Knights and Morgans base their epistemology argument on corporate strategies, but I believe this thought can be further developed. By highlighting both practices and values, strategies use a gentle but effective way of power to change how organizations and subjects work (Knights & Morgan, 1991). The purpose is to lead development to a desirable direction by giving the frames in which change is possible. Strategies need to consider different rules that restricts and frame the development processes in different sectors, in other words they show glimpses of what regimes are dominant. Taking this reasoning a step further and identifying that strategies can be narrow or wide in their spatial scope, it is possible to understand wide spread and ambitious strategies that include different parts of society, for example city strategies, strategies for a state or even global strategies for sustainable development, as the material representations of a meta-regime. This shows how strategies are much more comprehensive than singular policies or rules and is the reason why I find strategies well fitted for analyzing deep transitions and trajectories. The requirement of matching the materials with the research framework is met (Alasuutari, 2011).

What strategies made for singular companies and strategies for global development have in common is that they show the prevalent climate and ideas of the time. The visions represented in the strategies show the current culture, as in Nunns (2012) description of cultures as how we behave and think. Strategical documents are more than technical instructions, how and what is framed in them is important from the view of power and ethics (Knights & Morgan, 1991). In time, the visions in strategies may become realities. When analyzing strategies, the researcher should be sensitive to the culture they represent. As Nunn (2012) points out it is through the cultural changes, it is possible to identify larger shifts in our societies. From this reasoning I see strategies as windows for analyzing the bigger picture; they can show which dominant meta-regime is forming society today and give ideas regarding the directionality of change.

In this thesis, my goal is to show how strategies can be used highlight the spatial character of meta-rules connected to sustainability. I believe that by analyzing strategical documents one can show how far alignment processes have come in establishing a new trajectory for a deep transition. The governance aspects come from analyzing how current global strategies for sustainability are aligning to local strategies. Can a strategy using soft law, give local authorities ideas of how things should develop across different sectors and across different spatialities and time periods? Both governance and geography are essential components for the main methodological approach I take in this thesis, the alignment analysis. Strategies are however also relevant to the other two approaches I chose to cover. Regarding the mediated geographic understanding, if a strategy shows epistemologies then it is also possible to identify what spatial relations are highlighted and what consequences this may have. Strategies are also made by someone, the question of who and from where can be analyzed by focusing on the internal geography of the document.

8 Choosing Strategies

In order to analyze the geographical aspects of transitions and sustainability governance the selection of strategies play a central role. Going back to the three things I think geographers should focus on when analyzing strategies, I see some restrictions to the selection of strategies. My first approach regarding alignment leads to the notion that strategies included in this type of study should represent a wide variation of geographies in order for the researcher to draw a holistic picture of the current situation. This is probably the main geographical thing to consider

regarding the selection. Regarding the internal geography of a document, it would however be logical to choose strategies that are open to the public. Preferably, the strategies should be transparent and describe the process on how they were formed. How a geographic understanding is mediated in a document does not seem to put any further restrictions on the selection.

In addition to the geographical requirements, I see that the strategies chosen should be wide enough to represent societal development. Even if business and organizational strategies are interesting, in that they also show the culture and existing regimes, I argue that these may be too focused on a single regime. I think strategies that are more encompassing regarding local, national or global development, for example city strategies, will tells us the general story regarding meta-regimes more conveniently and in fewer documents.

8.1 Geographic Diversity

Making the theoretical framework for this thesis, I argued that geographers should not stick to one socio-spatial relation when analyzing geographical phenomena like transitions. Many studies connected to geographical variations have to date mainly focused on development patterns in various nations, but this is connected to the risk of researchers falling into methodological nationalism (Fuenfschilling & Binz, 2018). Territories are indeed interesting for these types of analyzes. For one, societal strategies are usually made for specific administrative units, which makes territories convenient study objects. The framework the territory sets for development is also important for making and re-making places, as it provides a unique set of cognitive and structural factors, for example laws, directives, sense of community and even nationalism (Jessop et al., 2008). These factors can be studied and analyzed in respect to the content in each strategy, which helps to understand why a strategy is formed in the way it is. Even so, it would be important to look beyond the national territories. By highlighting the TPSN framework in the selection of strategical documents, the researcher may account for other socio-spatial relations even if territories are the spatial units the strategies are made.

The “global” and “local” dialectic is interesting in term of what meaningful connections have been established between these scales. Has the global view regarding sustainability, represented in Agenda 2030, penetrated and become part of local governments’ strategies? To include

variation in scale is therefore something that the selection should seek to include. Differences in scale can be achieved by including strategies made for the global development, for the state and for municipalities. Other regions can also be included if a clear strategy can be found, for example the European Union. As I will discuss later, the notion of scales and documents is something that should be analyzed critically by making the internal geography clear.

When approaching different scalar strategies through a geographically sensitive approach it is important to understand that these scales are not always hierarchical. The local can affect the global and vice versa through complex networks (Jessop et al., 2008). Networks can be featured in transition research by identifying connections and alignment between strategies. For example, there may be strong similarities between the UN vision in Agenda 2030, a state's strategy and a well-connected municipal belonging to that state, while another more rural city in that state emphasizes something different. In this hypothetical situation, it is possible to see implications on the reach of UN's of governance regarding sustainability. As we see from this example, in order to highlight the complexity of networks, it is important not to restrict the analysis on scalar connections by only looking at them in a vertical manner. It is also important to identify horizontal variations. In other words, the selection of strategies should take into consideration how the place forms specific circumstances for development, which in turn affects the alignment processes in transitions (Murphy, 2015).

The socio-spatial embedding affects the culture and epistemologies that gets reflected in the content of the strategies (Knights & Morgan, 1991; Nunn, 2012). The existing place-frame may affect the way external ideals are adapted to societal development as every place has its own unique local power structures and flow patterns. A lack of coherence between strategies may therefore be a result of the socio-spatial embedding. Therefore, it is important not only to analyze singular representations of scales or places but also to identify the variety. Horizontal variety regarding the selection of states and municipalities could be achieved on multiple grounds. One factor that I consider especially interesting is "connectedness" or integration to global flows and western standards.

To move away from state centrism or a Eurocentric viewpoint, it is important to recognize that we cannot only define global development based on what western states are doing. Fuenfschilling and Binz (2018) predict that global regimes are more likely to take place in areas where institutions fit international norms and where the culture already is open for new

influences. These places are usually culturally more diverse. If the selection only includes those that fit these norms, the analysis will lead to a distorted view of the situation. On a global scale, it is possible to identify differences in integration of western standards and international norms; this was also the basis for the pentagon's new map (Barnett, 2003). From this map, it is possible to identify areas like the Middle East and large parts of Africa as gaps in connectedness. The selection of strategies when analyzing transitions should recognize these gaps.

It is also important to note that variation in connectedness does not only apply to world politics; well-connected city regions may for example have a quite different role in transitions compared to rural places (Hodson & Marvin, 2010). Even if small cities might not be as powerful and influential, I argue that we should be critical at the current focus on a few globally important cities and identify what happens in the regions outside these growth poles. This rural versus city discussion was also raised in the 33th international congress in Beijing with the theme Geography and sustainable development (Qiu, 2016). The discussion at this conference took a stance on city-regionalism, and they saw it as an important goal to straighten the bonds between the national governance and distant rural settlements. The recommendation to include both well-connected municipalities as well as rural cities within each country lifts this matter into the analysis. Without this approach, it is not possible to make conclusions on the spatial scope of the meta-regime depicted in Agenda 2030. Even if the urban population is continually growing, billions are and will be living in rural communities. How aware are these people of the sustainable development goals?

Because of these geographical insights, the researcher should base the selection of strategies on a variety of socio-spatial relations. Strategies for societal development are conveniently bound to territories, but it is important to include various territories that represent different scales. In addition to this, horizontal variation is needed. Connectedness is only one possible factor that can be used to establish variation between territories and places, but it is the one I recommend. The number of documents included in a study will depend on the chosen method. Qualitative and deep going analyses may only highlight a few geographical examples, while more quantitative generalizations can cover more strategies and therefore spatialities. In the end, it is the researcher's role to estimate and motivate when enough coverage is reached.

8.2 Strategies for Societal Development

Looking at empirical contributions of transition studies where researchers consider geography, see that most studies are based on specific socio-technical systems like water management in China or the energy industry in Europe (Fuenfschilling & Binz, 2018; Späth & Rohracher, 2010). In this thesis, I have argued that research should try to generalize the situation in order to understand social development more broadly. The selection of strategies is highly connected to this aspect and in addition to the above-mentioned geographical aspects, researchers should seek to select strategies that can tell us on what grounds todays societal development is based on.

I do believe both the private sector as well as public administrative view is important in order to include in achieving a complete understanding of transitions. However, when highlighting deep transitions, the administrative and public view of societal development is probably more feasible to start with. Strategies made by these entities should be more encompassing than single businesses that operates in a specific sector and that strives for maximum monetary profit. Public administrations are obliged to be more objective in their strategical approach; they need to provide a place for people to live in for generations to come. A sustainable city plan should for example take into consideration the challenges and connections between being green, being just and allowing growth (Campbell, 1999). Strategies for societal development, whether municipal or national, are therefore supposed to consider development more holistically than focusing on specific sectors. This leads to the conclusion that strategies for societal development are more about the meta-rules that connect different aspects of development than single rules or niche technologies. Deep transitions, the concept I base my understanding on, are about describing how these meta-rules change over time (Schot & Kanger, 2018).

It is important to note that in reality many players will try to shape the world to their fitting and needs (Flyvbjerg, 2004). Strategies for societal development are not formed in an enclosed environment; various actors are involved and they have to consider the needs of the business world. This can lead to internal conflicts within a strategy, and as Ward and Jonas (2004) show, city-regions development can be quite divisive in nature. For example, taking into consideration the interests of the private sector in order to keep relevant and competitive on the global market can go against some other parts of a sustainable societal development. The notion that a

document is a result of a consumption of different ideas seems to hold true and is something that the researcher needs to recognize (Freeman, 2012).

Another short notion on why I also chose to highlight public strategies over private is that these are more transparent and accessible than strategies of private corporations and organizations. At least this should be the case. Transparency will help to delve deeper into the formation of the strategies and to identify their internal geographies. Accessibility is of course needed in order to have any documents to analyze.

In practice, these statements mean that I recommend researchers to start by analyzing strategies formed by organizations like the United Nations, European Union, different National strategies and local municipalities. These administrative units are active in forming the circumstances and frames for development that will affect how other actors behave. Therefore, I see their strategies as essential when conducting research on emergence of a new deep transition. However, for a more comprehensive and detailed viewpoint on the issue of sustainability transitions there is also a need to recognize what other actors are doing in the name of sustainability, what are they prioritizing and how does their interests differ from the public administrative approach?

8.3 Agenda 2030

I will recommend only one concrete strategy in this thesis, the United Nation's Agenda 2030 (United Nations, 2015). This document shows 17 main goals and 169 sub goals for sustainable development, which according to Kates et al. (2005) is a way of defining sustainability. Agenda 2030 is certainly not the only definition of sustainability, but it has gained international acceptance and it fits well with the goals of this thesis and the factors I want to bring into discussion.

Based on that clear goals are important to have in order to achieve successful global sustainability transitions (Geels, 2011; Loorbach & Rotmans, 2006) as well as one strong entity that mediates the certain vision (Trent & Chavis, 2009), Agenda 2030 is a good starting point for analyzing the geography of transitions. The goals represented in the agenda are especially well fitted for alignment analysis. The goals represent a global administrative view of sustainability and by using them in comparison analyzes it is possible to get an idea of how far the global message has been able to spread through current governance approaches. The agenda

is also interesting looking at the internal geography of a document since it may highlight what a global document is and whose views are represented on a global scale. It is also possible to read and interpret how the makers of the document understand geography. Because of these three points, I consider Agenda 2030 to be an essential inclusion for doing document analysis regarding the geography and governance of a deep sustainability transition.

In the next chapter, I will first make a few general notes on what a researcher should think about when interpreting and observing political documents. Then I will move on to the three methodological approaches of analyzing the connections between sustainability, geography, governance and deep transitions. In each of the three analytical approaches, I discuss the role of Agenda 2030 in more detail. However, before that I shortly need to discuss the importance of methods and methodology.

9 Three Ways of Highlighting Geography of Deep Transitions

Choices on both methods and materials will influence the outcome of a study; same materials but different approaches can show surprisingly different realities (Häikiö & Leino, 2014). This shows how an understanding of used methodological approach is essential for the researcher in order for him or her to make grounded decisions and be reflective and critical of the results. Many methods can be used to approach the topics I discuss in this thesis. I will however mostly focus on interpretative policy analysis approaches for extracting observations from strategy documents.

Whether visual, textual or based on experience, observations play a key role in empirical research. Observations are always connected to meanings as they are extracted from a specific context (Grönfors, 2015). As Alasuutari (2011) points out, it is important not to take an observation out of context, as the meaning might then change. So, even if generalization often is essential, it is important to preserve the richness and the sense of variety when doing so. Approaching observations as leads that can be connected, is in the end about establish new information and a deeper understanding (Alasuutari, 2011). However, not all observations are equal in their relevancy, validity and accuracy. How the researcher acquires observations is a key question in forming new information. Observations can for example be legitimized by framing the analysis according to a plan and or to a framework, by observing in a consistent

manner or by using classification (Grönfors, 2015). Transparency is essential, and the researcher needs to make argument for each methodological decision.

A theory behind observations is hermeneutics, which explains how the world is built of interpretations and how these are affected by the past (Oesch, 1996). It is important for a researcher to identify his or her own interpretation, values and given meaning to observations when trying to comprehend complex and contested phenomena, such as transitions and development (Kampelmann et al., 2018). Thinking about hermeneutics lifts the complex relationship between information and researcher into discussion, but also that the world should not only be described through "facts". This is related to the interpretation of texts and observations made from documents; A document's meaning is based both on the researcher's interpretation as well as how the makers of a document are understanding and interpreting the phenomena described in the document (Häikiö & Leino, 2014). A researcher cannot control the makers' interpretations, but he or she may control how they understand the documents. What a researcher recognizes in a document depends on many things, for example background, values, education, experiences and expectations, prior knowledge and political literacy. To know this is essential. The strategical documents that are chosen for this type of study should be analyzed critically and self-reflection should be applied to each of the methodological approaches I go through in this thesis. What is interesting for the research question and to the approach may be a side issue in the document itself. This shows why a researcher should not force any findings to fit the theoretical framework. On the other hand, reflecting over how various observations connect and position in respect to a theoretical framework is a fundamental step in a research process (Grönfors, 2015).

In order to understand a political document a person needs to go deeper into the true message of a document, understand the political meaning and identifying how it connects to the societal discourses that were present when it was made (Palonen, 1987). It would therefore be good to get familiar with the context a document is made. Interpretative policy-analysis can be used to distinguish on what grounds societies are forming, why some worldviews are being institutionalized and commonly accepted while other are not (Häikiö & Leino, 2014). Interpretative policy analysis is not a method per se; it is more about the approach and recognition that the world might be too complex to understand in simply numbers. Interpretive policy-analysis approaches try to identify the interpretations within a policy and reflect over the

interpretation of a policy. I believe these types of approaches fit the research goals of understanding deep transitions through document analysis (Table 3).

Table 3. Three methodological approaches I use in this thesis to highlight the theoretical framework and the connections between geography, governance and transitions.

Approach	Alignment Analysis	Internal geography	Geographic understanding
What	Are there alignment between Agenda 2030, national strategies as well as municipal strategies for societal development?	The process of making a document is inherently spatial, how does different actors affect each other?	Makers of strategies understand geography in different ways, how is it mediated in a document?
Why it is important	Understanding, preferences and values of those in power: planners, politicians, researchers etc. form the path for transitions. Can we see forming of a new sustainable meta-regime?	Whose and what worldview are represented in Agenda 2030? How and to what extent local decision makers are familiar with Agenda 2030 shows UN reach of power	How decision makers and planners understand geography may affect approaches for sustainability transitions. Do they approach development from enclosed spaces or are they open for a wider understanding on spatial connections?
Recommended methods	Document content analysis and research on contexts	Document analysis and interviews	Document analysis, using the TPSN framework
Role of Interpretation	The comparison between documents is based on interpretation; classification based on the goals in Agenda 2030. The spatial context affects the content in a strategy, how is based on both the researchers and the makers interpretation	The researcher interprets connections between all documents. In the interview situation the interviewee answers and analyze the situation from their own understanding, the interviewer interprets the answers	The researcher needs to interpret the document content regarding mediated geographic understanding. The TPSN-frame work (Jessop et al., 2008) gives a structure to follow

Before I go into the three approaches in the table above, and how they connect to sustainability deep transitions, I make one last remark on methods. Even if I highlight document analysis in this thesis, researchers should not be restricted to this specific method when trying to understand such complex phenomena as deep transitions. When needed, the researcher should go beyond analyzing documents. As I will show in the following sections, in order to develop a deep understanding of the documents and the phenomena behind a document the researcher may benefit from other types of analyses. Getting familiar with the context can be a great way of explaining why a document includes the things it does. Interviews can on the other hand be used for identifying social networks and power structures that existed when the document was formed. When mixing methods in the same research, the research tone and understanding should be similar. In the following chapters, I hope to show how interpretations can be a bridging factor for different methods. If reality, as the interpretative policy analysis argues, is built through our interpretations, then in order to understand transitions we need to get to these interpretations (Sorrell, 2018). Interpretations will play a role in understanding the transitional alignment based on strategies of societal development, the internal geography when forming strategies and the mediated geographic understanding in a document.

9.1 Alignment Analysis

My main intention with this thesis is to show how a geographical understanding and analytical approach matter in research on deep transitions. I will therefore give most space to the alignment analysis approach, which is about identifying if we are reaching a degree of hegemony on a set of rules, a sustainability meta-regime that is cross sectoral, temporal and spatial. First, I discuss the premise of this study and the role of Agenda 2030 as a framework for sustainability. After that, I go through a three-step method for comparing and analyzing strategies for societal development, each step developing a deeper understanding of the content and on why geographical perspectives are needed.

Documents provide a way for researchers to delve into meanings and worldviews of the actors behind them (Häikiö & Leino, 2014). I therefore argue that in order to see how current global governance affect sustainability between localities and scales, one can use alignment patterns in strategies for societal development. Strong connections would indicate an establishment of a coherent architecture for the earth system governance for sustainability. The questions this alignment analysis approach tries to answer are ambiguous and ambitious; is development still

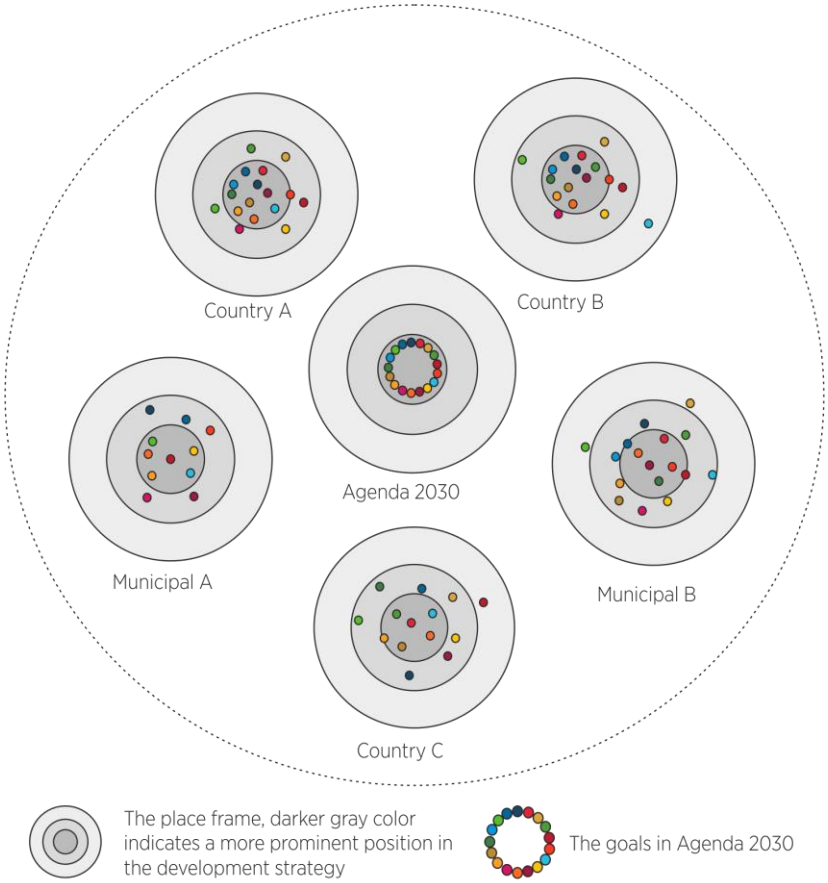
based on ideals of mass-production and global capitalism, or can we identify institutionalization of new interpretations and worldviews regarding social justice and environmental protection (Perez, 2013)? Large-scale change requires localized effort (Morgan, 2009), but how, and to what degree is global governance of sustainable development connected to national and municipal strategies?

As stated before, I believe UNs vision represented in Agenda 2030 should be considered as canon for sustainability. It is a comprehensive view of what sustainability should be, and the 17 goals and 169 targets can be interpreted as rule-sets for a new meta-regime for sustainable societal development on a global scale (Picture 2). Due to history and continuous work the United Nations have established relatively stable relationships of power in different parts of the world (Boutros-Ghali, 1991). The power arrangements that the United Nations has developed since the Second World War have helped the UN to establish a presence from a distance. Wood (2016) identifies documents, as Agenda 2030, to be material forms of policies and strategies and actors can use these documents to spread ideas. Wood mentions that these documents do not even have to be read and that the notion of their existence may be enough for adaptation to the ideas presented in them. These relationships do not form a centralized and unchanged hierarchy, but as Allen (2003) points out, power is about the effects that varies dependent on place and time. This has allowed a variety of meanings and actions to be put under the same sustainability banner, which actually can be beneficial when aligning political action (Jordan, 2008).

Picture 2: The United Nations 17 goals for sustainable development (United Nations, 2018).

The power modalities of negotiation, allure and persuasion etc. that are used for spreading Agenda 2030 have great spatial reach, which is why I argued global governance for sustainability should take this approach. But, as Allen (2003) point out, the effect of these modalities might not be immediate and action is not guaranteed. It is therefore interesting to see if the UN has been able to use its relationships and establish a presence in distant places. For example, both the Finnish state (Prime Minister's Office, 2016) and the City of Helsinki (Helsingin kaupunki, 2019) seem to be affected by the agenda. In addition, other institutions like universities are starting to follow Agenda 2030 in their sustainability strategies (Korhonen et al., 2020; Soini, Jurgilevich, Pietikäinen, & Korhonen-Kurki, 2018). I think researchers should explore these signs further and identify what happens beyond and within the Finnish context. Are all cities and municipalities equally eager to act towards sustainability or are they even aware of Agenda 2030?

However, even if we might have reached consensus on the fact that sustainable development is a good direction for societal transitions, it remains unclear if the goals and rules within this concept have started to align into meta-regimes that steers societal transitions (Schot & Kanger, 2018). Processes of alignment needs to take place between rules and goals in different socio-technical regimes (Loorbach & Rotmans, 2006) and as Nilsson and Persson (2012) write, between local neighborhoods and organizations and institutions that operate on higher levels i.e. national, regional and global. Alignment of institutions and their principles allows for a coherent and effective architecture for earth system governance (Biernmann et al., 2009). This is why the question of alignment is so interesting for deep transition analysis and establishing a new trajectory and a meta-regime for sustainability. Fuenfschilling and Binz (2018, 739) state that global regimes are "the dominant institutional rationality in a socio-technical system, which depicts a structural pattern between actors, institutions and technologies that has reached validity beyond specific territorial contexts, and which is diffused through internationalized networks" (Picture 3). Even if Fuenfschilling and Binz are referring to more specific sectoral transitions, I see that the same model and concept of thinking can be used to identify how and if we can see a new meta-regime for sustainability.



Picture 3. Illustration of a global meta-regime based on Agenda 2030, most of the goals are present and aligns to the strategies that pictures the place frames. Inspired by the work of Fuenfschilling and Binz (2018, 741).

Institutions have a central role in determining long-term trends and in establishing synergy for societal transitions (Perez, 2013). In similarities or variations between these institutions' strategies for societal development, I believe it is possible to find connections regarding their stance on development and sustainability. Despite the risk of being rejected, Agenda 2030 has gained international recognition; it was co-created by an international group and is accepted and signed by 193 countries in the world (United Nations, 2015). Therefore, even if it is contested whether Agenda 2030 is a satisfactory document for sustainability as neither was agenda 21 (Jordan, 2008), it is the best vantage point we have for describing the current administrative view of sustainability on a global scale. Agenda 2030 is also something that is tangible. In contrast to the vague and many descriptions of sustainability, the ideas presented in this document can be traced and followed in a structuralized manner. Now I will go into a possible process for alignment analysis that will lift governance, geography and transitions into discussion.

9.1.1 A Three-step Process

The approach I recommend for this is about how various strategies, representing different spatialities, are aligning to each other and why. The approach goes through three stages; the first two are about content analysis and the last is about getting familiar with the context and geographical aspects more generally.

There are three main categories for content analysis, basic content analysis, interpretive content analysis and qualitative content analysis (Drisko & Maschi, 2015). In principle, these varies in how deeply they go into the message in a document. The basic content analysis may be used for literal analysis, exact words and phrases, while the interpretative and qualitative goes deeper into documents' meanings. As Drisko and Maschi (2015) note, the boundaries are not always clear, for example a basic analysis can be made on a more inductive basis and an interpretive may be lacking depth regarding self-reflection. I believe both these approaches to content analyses have strengths that can be utilized for the alignment analysis I present here.

Starting with basic content analysis, the strength is in the possibility to analyze a high number of documents. Using automatized processes for comparing the content in various strategies for social development is a simple, yet effective, way for analyzing alignment patterns. Because I selected Agenda 2030 as guideline for the emerging global meta-regime, it is natural this document function as base for the themes included in the comparison frame. Not only are goals a popular way of defining sustainability (Kates, R. W. et al., 2005), they are also relatively easy to identify from documents, and therefore to compare. The 17 main goals and the 169 targets represented in Agenda 2030 provide a clear structure that researchers can use for identifying sustainability in other strategies. This also follows Valli and Aaltolas (2015) recommendation that researches should take systemic approaches to interpretation and not base it simply on intuition.

The comparison of results can be visualized and analyzed through a cross-tabulation chart (Table 4). From the table it is possible to get a preliminary idea on what goals, i.e. rules, societal development generally support. By following my earlier recommendations regarding geographic diversity in the selection of the document, the analysis can also recognize geographical variations and identify if the ideas presented in Agenda 2030 have been able to

reach down to localities, penetrating territories, scale and places. It therefore can show the effectiveness of the governance system lead by the UN.

Table 4. A hypothetical outcome of the basic content analysis. A preliminary idea of geographical variation is formed, which can be used for further studies.

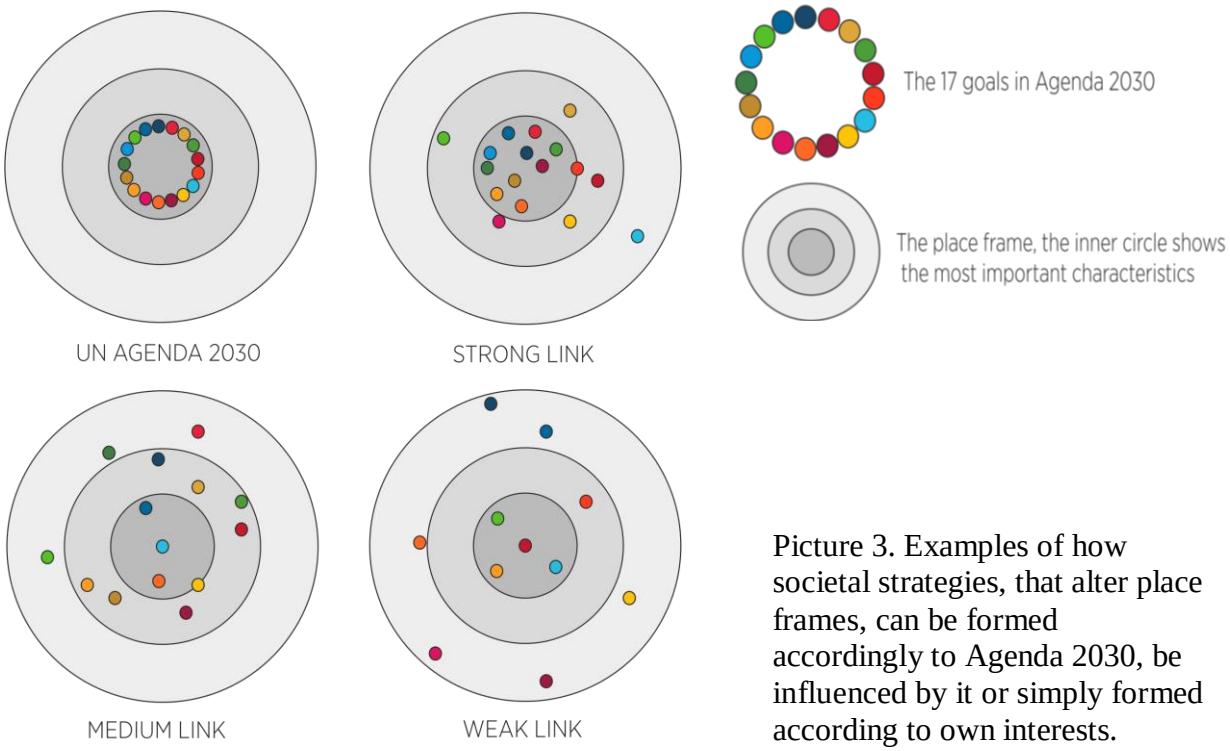
Goal in Agenda 2030	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
UN	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Country A	x			x			x		x	x	x			x		x	x
Country B	x	x	x		x		x				x	x	x		x		x
Municipal A		x	x	x	x	x	x			x	x	x	x			x	
Municipal B	x		x					x						x			x
…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…

There are of course some weaknesses to this approach and the main concern I have is that the basic content analysis only tells us a shallow story. Using many documents helps in making a generalized picture of the situation but the strict and a literal comparison structure does not allow for a deep understanding of meaning, values and power structures (Drisko & Maschi, 2015). To what degree a goal is discussed in a strategy is also something that the basic content analysis cannot answer. Even if something is mentioned, it does not mean it represents a guideline for development. A third weakness is that the basic content analysis cannot identify local innovations, which play a key role in local sustainability (Seyfang & Smith, 2007). It is important for local places to consider their own needs and priorities and come up with solutions that fit these when planning for future developments. For example, clean water can be a key element for achieving sustainability in India but may not even be recognized in the context of Finland. Nevertheless, it would be false to state that this mean that the Finnish state or municipalities would not value this aspect of sustainability. Finally, it is also important to note that local solutions can be sustainable even if not following Agenda 2030.

To include the above-mentioned aspects and to get a deeper understanding on the alignment processes I suggest turning to interpretative content analysis, which is the second step of the alignment analysis approach I represent here. The researcher should still ask the same question

as before; how well do the worldview and values mediated by the administrative units correspond to the values and ideas in Agenda 2030? Now, when answering this question the researcher should use interpretative content analysis that allows for a deeper comparison of strategies.

Going from basic content analysis into interpretative content analysis, more involvement and thought is needed from the researchers part and self-reflection becomes essential (Drisko & Maschi, 2015; Häikiö & Leino, 2014). Categorization and interpretation take place in our minds whether we know it or not, hence it is essential to describe the thought processes (Palonen, 1987). When analyzing the documents in this detailed and reflective manner, the first thing is to narrow down the selection of documents included. Following the three-step method I recommend in this thesis, this should be based on the basic content analysis. Strategies that are consistent with Agenda 2030 as well as anomalies are interesting study objects going deeper into the content but retaining the scope of variation. The researcher should also consider geographical variations, for example based on how integrated places are. Globally the pentagon's new map (Barnett, 2003) can be followed, but also variations of countries and municipalities should be included. Based on the content in a strategy the researcher can then interpret what aspects of the agenda is treated and to what extent (Picture 3). This way the chosen strategies can be visualized and put in comparison to each other, can we find a strong global meta-regime as I showed before (Picture 2).



Picture 3. Examples of how societal strategies, that alter place frames, can be formed accordingly to Agenda 2030, be influenced by it or simply formed according to own interests.

Interpretative content analysis also lifts the focus from the written content to the building blocks of the "institutional story" mediated by the strategy (Häikiö & Leino, 2014). It is more about how and why one worldview has become dominant as well as the dynamics between competing and clashing worldviews. This fits well with transition studies; as new niches get accustomed in people's daily lives or a crisis occurs in the landscape the institutionalized meta-regime for societal development gets contested (Geels, 2011). Alignment between values and goals is also a big factor for success in adapting new sustainable initiatives in communities (Trent & Chavis, 2009). Interpretative content analysis can be used on strategical documents in order to identify what "truth" and values current transition trajectories are based on. There is also a meaning in absence, so the aspects that are neglected in a strategy can be equally interesting as those that are highlighted. From a document, it may even be possible to read what is behind certain strategical decisions.

When interpreting the content in strategies, the researcher can take help of the deep transition framework by Schot and Kanger (2018). This allows the researcher to contextualize the results and reflect over them about the scope and direction of societal transitions. For example, if rules are repeated and shared in all strategies, it could be a sign of a meta-regime and the start of a new deep transition. However, if there are similarities in some aspects of the strategies but not in other, it is most likely specific regimes that are changing and not the value-based meta-regime. Reasons for the latter could be many, for example failing global governance and weak institutions (Loorbach & Rotmans, 2006) or using power-modalities that are ineffective in making sustainability a norm for development. Variations in strategies may also show how local circumstances are essential in decision-making, which leads to the important notion of geography.

The last step in this alignment analysis approach is for highlighting geography when conducting research on deep transitions. It is about highlight the findings from earlier steps with examples and getting familiar with the spatio-temporal context. This requires the researcher to move away from simply document analysis and get familiar with the contexts and local needs. The geographical understanding in the two former steps relied only on the selection of strategical documents. Researchers should however aim for a more nuanced way of understanding geography and go into the explanation and meaning of different socio-spatial relations (Jessop et al., 2008). Research observations are best utilized if the researcher knows in which context it has been produced and when he or she understands how it fits in a broader discussion

(Grönfors, 2015). Through endogenous and exogenous processes, the place-frame is modified and may even start to support niches it rejected in the past. This is why I think it is important for researchers to make notions of the socio-spatial embedding and power structures behind at least some of the strategies that is concerned in the study. The researcher should go more profoundly into the strategies and to see under what circumstances and for what socio-spatial embedding the strategies were made.

By considering geographical variations and factors, the researcher may also build his or her interpretations on a steadier ground and develop a more accurate and holistic picture of the situation. For example cultures, described as the common rules and values or even as a localized collective intuition, are spatially distinct and have a great role in decision-making (Nunn, 2012). In addition, other spatio-temporally bound phenomena affect development, for example, history, laws and regulation, demographics, natural resources and traditions all influence what type of societal development the administrative units pursue. Places have different preconditions for development towards a more sustainable direction. As mentioned earlier, place-frames form restrictions and possibilities for local change (Murphy, 2015), and therefore I see these are important to understand in detail. For example lock-in situations, earlier mentioned in the context of co-dependency between socio-technical systems, can be spatially specific (Grin et al., 2010).

In addition to observing socio-spatial dimensions, the question of power and power structures should be identified (Murphy, 2015; Truffer et al., 2015). Who are in power and according to what interests are the place-frames formed? In the USA, we can for example see how cities stand up and deny the Trump administration's will to deport illegal immigrants (Somin, 2018). This case adds to the perception of dynamics involved in transitions and it shows why spatial variations needs to be recognized. In order to truly understand the dynamics, the researcher therefore need to ask why global governance affects local places and on the other hand why nations and municipalities stagnate into same old development patterns. Without understanding the existence of various territorial contexts, complex networks and the meaning of local, the researcher would fail to understand how global governance of sustainability is modified to the place-frames that steer local development.

Utilizing this three-step method for alignment analysis, I believe researchers can get a generalized but also detailed understanding of the situation. This is important in order to

highlight the complexity sustainability involves (Willamo et al., 2018). Moreover, as Häikiö and Leino (2014) point out, different methodology and methods provides distinct result in a study. The researcher can use this to their advantage and use various methods that support each other in an approach.

Now I will move on to the two other approaches I chose to highlight in this thesis, namely to the geography mediated in a document and to highlighting the internal geography in strategy formation processes. Both approaches can be used in addition to the alignment analysis, however as they are not my focus in this thesis I will only discuss them shortly. They are still interesting and relevant for reflecting over real world processes as well as highlighting geographical approaches in transition studies. They will therefore provide another layer of complexity to the study.

9.2 Mediated Geographic Understanding

Sorrell (2018) asks for, a deeper understanding of transitions through opening the concepts of ontology and epistemology. A sophisticated and reflective way of content analysis allows the researcher to understand a document and the people behind it on a deeper level (Drisko & Maschi, 2015). I therefore recommend the same content analysis method as in the alignment analysis when trying to understand the geographic understanding of the document makers. However, now I direct the question in a way that the researcher get another and slightly different viewpoint to his or her interpretation of the same documents that were used in the alignment analysis. How do the people behind the document apprehend geography in relation to development and societal change, and why is this important?

As strategies about societal change on a local, national or global level need to recognize contexts; it is possible for the researcher to read scalar logics and other geographical concepts from the documents. I want to highlight the fact that strategies themselves does not represent a geographical unit, even if I at some point in this thesis seem to draw parallels between strategies and different spatialities. Documents and the strategical decisions in them, show the governmentality and the mind-set of different political institutions that act on different geographical scales, places and territories. Consequently, researchers should recognize documents as socio-spatial constructions. The geographic mentality weaved in in their construction would be interesting to unfold.

I will not repeat and go deep into the method of interpretative content analysis, but I will give a frame for the interpretations. Researchers should make observations in way that reflect a theoretical framework so that they can put their findings into context (Grönfors, 2015). I therefore chose to tie back to the TPSN framework I earlier discussed in bringing geography into transition studies (Jessop et al., 2008). This framework reflect the importance of looking at phenomena from different perspectives and identify how they connect with each other. Leitner et al., (2008) also recognize this to be important for a holistic understanding. For example, places are not stand alone pieces but they are relative to other places, positioned in territories and affected by different flows of material and power. The TPSN-framework by Jessop et al. (2008) has a matrix that can be used in document content analysis to systematically look at structuring principles as well as fields of operations (Table 5).

Table 5. The TPSN framework can be read in three ways: by themselves (marked green), as a field of operation (vertically) and as a structuring principle (horizontally). Table redrawn from Jessop et al. (2008, 395).

Structuring principles	Fields of operation			
	Territory	Place	Scale	Networks
Territory	past, present, and emergent frontiers, borders, boundaries	Distinct places in a given territory	Multilevel government	Interstate system, state alliances, multi-area government
Place	Core – periphery, borderlands, empires, neomedievalism	Locales, milieux, cities, sites, regions, localities, globalities	Division of labor linked to differently scaled places	Local/urban governance, partnerships
Scale	Scalar division of political power (unitary state, federal state, etc)	Scale as area rather than level (local through to global), spatial division of labor (Russian doll)	Vertical ontology based on nested or tangled hierarchies	Parallel power networks, nongovernmental international regimes
Networks	Origin – edge, ripple effects (radiation), stretching and folding, crossborder region, interstate system	Global city networks, polynucleated cities, intermeshed sites	Flat ontology with multiple ascalar entry points	Networks of networks, spaces of flows, rhizome

A researcher can make interpretations and classification according to the descriptions in this matrix in three ways: as a structured field, as a structuring principle or in itself (Jessop et al., 2008). When doing document analysis and strategies I believe the most useful way of utilizing

this matrix is by looking at the field of operation. This is especially interesting for deep transitions and the governance of sustainability, because it can highlight how the administrative units sees themselves in relation to others and through what spatial mechanism they see themselves using power. Hence, it is more practical than looking at principles, and indeed more holistic than by looking at a socio-spatial relation by itself.

So, why is this important to know how the people behind strategies conceptualize socio-spatial relations? I chose to include this approach in this thesis, as I believe understanding individuals' perceptions of geography can be useful in transition studies. Analyzing spatiality and the mediated geographic understanding of individuals with decision-making power or those with possibilities to influence them, can explain certain decisions in strategies. It can also show the willingness to act beyond a strict territory. As a crude example, a country focusing on only their own interests show a lack understanding or willingness to identify their role as a player for tackling global challenges but it may also lead to weak approaches toward sustainability internally for example in different municipalities. The relations people behind strategies make to other places can have a big effect on what type of strategies are formed. Is the strategy for societal development within an administrative unit place specific or does it identify networks and possibilities to be included in vaster networks? The latter could be an example of state rescaling in order for states to get competitive advantages in the world economy (Brenner, 2004). Not only does the socio-spatial conception show how a territories relations to other, it can also be about the conception of place, how do the administrative unit recognize different meanings of a place and the co-creation of place frames? The place framing and power structures have concrete impact on what type of transition is aimed for in a specified locality (Murphy, 2015). This is of course also a question of justice and ethics, which is important for sustainability. As Allen (2003) show, geography can even go beyond concepts and ideologies and into the spatiality of power, which in turn is connected to actions and methods used to achieve change.

I have now identified that documents are socio-spatial constructs, which also are bound to their time, and raised some points on why it would be interesting and even essential to understand the mindsets of the people behind the documents when studying transitions. The next methodological addition that further develop a geographical understanding on deep transitions is about the process of making strategies. The internal geography of documents is about who

the people behind the strategies are, whose view is mediated in a strategy and how the relationships and contacts may affect whether or not alignment of strategies is achieved.

9.3 The Internal Geography

In this last approach to geography and document analysis, I ask the researcher to highlight processes behind strategy formulation. First, by highlighting the structures and movements of policies, or as in this case strategies, it is possible to get a deeper understanding of larger phenomena's such as globalization (Moisio et al., 2018). This is good, as we are interested in how a possible sustainable meta-regime is forming on a global level. Second, strategies for societal development are political and infused with power; the question is whose view and whose frame for development is going to be dominant? Researchers can use the institutional structure of a document to answer this type of questions (Häikiö & Leino, 2014). Those behind the content in a document and their motivations may however be unclear, also described as institutional vagueness. Because my thesis is about geography in connection to global governance for establishing a new trajectory for deep transitions, I will focus on the internal geography to highlight globalizing processes, but still keep the discussion connected to the institutional vagueness and the interests and actors behind strategies.

The actor-network theory highlights the fact that we have both non-human and human actors that can effect policy processes and therefore transitions trajectories (Gao, 2005). Non-human actors are for example technology, institutions, regulations and laws. As Gao mentions, the non-human factors give a framework for human-actors to follow. However, as I already pointed out in the theoretical framework of this thesis, I want to move beyond understanding technical development in socio-technological regimes. This was why I adapted to the deep transition framework by Schot and Kanger (2018), as I believe it is better suited for picturing how far global sustainability is today. The meta-regime that affects the direction for deep transitions shows a mentality for development beyond specific sectors of the society and that stretches over geographical borders. Therefore, I find that even if non-human actors are important, it is essential and maybe even more interesting to look at the human actors, which will give insights on motivation, interests and worldviews (Gao, 2005). Even if Gao says that non-human factors give a framework to follow, it is humans and their motivation that enable the use of specific technologies. The values and cosmologies of human actors cannot be separated from the forming of new strategies.

Space always have a social meaning; it gives opportunities to specific ideas and at the same time acts as a barrier to other (Allen, 2003). Concretely this can be seen in the modification of policies, as they are subject to the actors involved and localities concerned (Wood, 2016). I believe that the internal architecture behind the world system governance, mentioned by Biermann et al. (2009), can be highlighted when analyzing the formation of strategies. Global governance for sustainability need to align different geographies and actors into a common direction for development. To do this, governance needs to be successful in including actors, human and non-human, in the same network (Gao, 2005). The interest I raise in regards to the internal geography is to see who and what is behind the globalization of the sustainability meta-regime depicted by the UN in Agenda 2030. There is however a dilemma, a methodic problem, that needs to be highlighted.

Global strategies are de fact, a combination of national and local views. To neglect this aspect, much of the geographical understanding I have tried to bring into transition studies are lost. Global governance is structured spatially and this will have an effect on mediated cosmologies and worldviews. The latent power structures are interesting especially when looking how context affects transitions trajectories (Murphy, 2015). As Whitmarch (2012) noticed in his study on transportation systems, power structures and the people behind decisions are essential to highlight in order to understand why transitions look different dependent on place. This shows how the process behind Agenda 2030 can tell us more about the power structures but also about geographical connections behind governance for sustainability. So, the questions researchers should try to answer is who is included in the network of Agenda 2030, as a global guideline for sustainability? What views are neglected or unnoticed? Does the process reflect the alignment analysis results? In what ways are the administrative units included in the study connected to the UN, or are they even aware of Agenda 2030? I hope that these questions will help the researcher to reflect on the complexity of policy movement and governance for sustainability. In addition, these questions show why spatiality and social context should be included into the study. As the networks behind the global strategy become clear, so does the meaning of geography for deep transitions studies.

Researchers can use different methods to lift the institutional background of documents. The process of strategy formation can be transparent in the document itself, it can be described in other documents, it may have to be interpreted from a collection of documents, or maybe even by conducting interviews with the makers. Agenda 2030 is an important document for this

thesis and I will therefore use it as a short example. In paragraph 52 of Agenda 2030, there is a mention of "our journey" and that "it is "we the peoples" who are embarking today on the road to 2030" (United Nations, 2015). Who are "we" that speak on behalf of everyone? The document actually gives an answer who stands behind the document, but it does not go in on their role in forming the agenda. The process and internal geography behind the document hence remains unclear. The process of making Agenda 2030 is actually described in other documents, for example the Post-2015 Development Agenda: Guidelines for National Consultations the guidelines for forming Agenda2030, describes the process in more detail (United Nations, 2012). Reading this document it becomes clear that different working groups and consultations from 50 specific countries were chosen for forming the new sustainability agenda. The people in these working groups represent a variety of societal actors, from experts to indigenous people, and who in the end together affect the view and comprehension we as readers get from the agenda. The analyze could go deeper and see from which cities these people come, what their worldviews are, from what socio-economic background they come etc. It would also be interesting to identify the power structures within these working groups, whose opinion weighs most? This shows that analyzing internal geographies and institutional structures can go very deep. The dialectic between how Agenda 2030 is made of local people and how it in turn affect local strategies for societal development is something that needs to be considered even if the research focus would only be on for example alignment analysis. For an overall comprehension of the connections between geography, governance and transitions, these connections would be good to highlight for each strategy considered in detail.

Not all administrative units will be as open as the UN when they describe the process of strategy formulation. That said, one should still be critical towards the UN and Agenda 2030 process, even if it seems to be made in an inclusive manner there might be imbalances in whose views are mediated. Are for example city populations more represented than rural settlements or are expert views held more valuable than others? If there are no documents that researchers can use to get an idea of the internal geography, they may have to utilize other methods in order to understand how a strategy was formed and on what basis. Phronetic planning research can for example be used to identify actors behind strategies for societal development (Flyvbjerg, 2004). This approach looks critically at if a desired development of a place-frame serve a specific interest and through that identify actors involved and hidden power structures. Interviews are also a good way to unravel processes behind strategies, and more.

Strategies in themselves are concrete which can help researchers trace their movement, but this also mean that they are static and only tell a chosen story. It can be hard to see real interactions and processes behind the formation of a strategy only by analyzing a document. An interview with the makers of a strategy can raise interesting viewpoints on the process behind the formation, hence opening new possibilities for analyzing the geographical reach of Agenda 2030 and the forming of a new meta-regime. Interviews can give more insight on why transitions may differ in various places. The possibilities of questions are many; to what degree are the actors behind the strategy familiar with the message in agenda 2030? How has the sustainable development goals affected the content in their strategy? Can they even point out through what networks they got in contact with the message mediated by the UN? These types of questions highlight the internal geography of a document. The researcher may also ask questions that related to the other approaches I have presented in this thesis, for example, questions derived from the TPSN framework can be used to figure out the maker's geographic understanding. Questions about values and motives may on the other hand get us closer to the, often forgotten, anthropogenic side of transitions (Kampelmann et al., 2018). What meanings are imbedded in their strategical vision? A document is also only a representation of what is documented; hence reading the document can give another intention than makers had in the creation process (Alasuutari, 2011). Interviews can make this clearer.

I have showed that researchers can get a deeper look into transitions by approaching strategies from multiple methodological angles and through different methods. If possible, the researcher should compare the results and find connections in the alignment analysis, the mediated geographic understanding and the internal geography. These approaches allow for a more comprehensives overview on deep transitions; they help to identify deeper meanings and connections in strategies, to analyze the context the strategy was made, to identify implications socio-spatial relation has on the strategical approach as well as how actors meditate meanings and ideas across spatialities. This all adds up to the complexity and detail needed to understand governance and transitions towards sustainability. As a result we might get an idea if local administrative units support or contest global governance for sustainability, or indeed if these entities have the power or will to do so.

10 What Tomorrow Brings — Contributions to the Field

The internationalization of problems is evident, whether it is about human right questions connected to democracy and migration, growing inequalities due to liberalist capitalism or environmental issues connected to climate change. Problems may escalate and the effects of human existence on earth may not even be fully comprehended. Despite this, there are signs that societies are growing more aware of the situation and with that, a growing will to tackle these problems. It is evident that we need to build a new ruleset for development that steer societal development into a fundamentally different direction (Biermann et al., 2012). The concept of sustainable development has been in the making for a few decades and despite being quite vague, it shows an alternative paradigm for global development (Sneddon et al., 2006). In this thesis, I have identified signs that sustainability have become more important in institutional development strategies, both on a global level, in nations, in cities and in various organizations. Nevertheless, it remains unclear whether or not current global governance, led by the United Nations, has been successful in establishing some type of coherency in how different actors approach societal development beyond specific places and institutions.

We live in a world that is steered by semi-coherent rule systems, i.e. regimes, some of which are place specific while other are globally relevant (Fuenfschilling & Binz, 2018). Schot and Kanger note that some regimes co-exist and become dominant in different socio-technical systems and in different spatialities, these they call meta-regimes. I believe sustainability can be seen as a potential competing meta-regime in the age of global capitalism. My theoretical framework and recommended methodological approaches stems from the topical question of whether the United Nations approach to governance of sustainability has been able to change the dominant meta-regime from the industrial revolution to a brand new direction.

At this point in my thesis, it is also clear that I see the coherence between spatialities and sectors as an important factor for successful global governance towards a sustainable deep transition. I have sought to highlight this dynamic through treating sustainability, transitions, governance and above all geography. Many of the complex, interlinked and wicked problems regarding sustainable development take a transboundary character and ignore man made political territories. This geographical insight was the second thing that formed my thesis, I wanted to show how a geographical understanding plays an important part in this understanding and analyzing this mayor transition but also give ideas on how change may be possible.

To answer both of my interests I first discussed transitions and transitional models in order to establish a conceptual understanding of societal development. I also showed how sustainability has become a part of transition studies and developed the idea further by widening the concept of transitions. I found that the deep transition framework by Schot and Kanger (2018) was best suited for this thesis topics and describing societal change on a global scale. However, current models on transitions lack geographical insights and I therefore sought to develop them through understanding geography from four different socio-spatial relations: territories, places, scales and networks (Jessop et al., 2008). In addition to this, I discussed power as a geographical phenomenon. The last topic I discussed when building my theoretical framework was governance and I believe this was an important inclusion in order to show how a deep transition could be altered into a more sustainable trajectory.

Based on the insights I give in the theoretical framework, the approach the UN takes on sustainability governance seem right and the power modalities used feel appropriate. As Allen (2003) notes, we do not have a global surveillance force and global governance should therefore rely on power modalities that are associative and cooperative. Force is not feasible. The idea that change should occur from the bottom up through active citizenship and local innovation (Seyfang & Smith, 2007), is also in line with Agenda 2030. By combining localities to a strong global network, but still taking in consideration local needs, a global semi-coherent trajectory for sustainability should be possible. Regions and municipalities are therefore important to consider in addition to nation states (Graymore et al., 2008). It will however take time and continuous work to fit together local-place frames and imaginaries with the global view of sustainability mediated by the UN. In order to become dominant, the meta-regime as described in Agenda 2030 should be institutionalized as a "common horizon of understanding" all over the world. Whatever we chose to call this global understanding or culture, it will affect how people think and react in different circumstances and how they act in their lives (Nunn, 2012). Cultures and worldviews take time to change and it is ethically contested if they should change. Alignment and co-creating a new rule-set to follow across societies may however be the only way to achieve sustainability on a global scale (Leiserowitz, Kates, & Parris, 2005). So how far have we come?

Scot and Kanger (2018) raised the need for empirical studies on the connections between context and deep transition. Even if I did not have the space to include empirical research in this thesis, I did develop a research frame that can lift the connections between geography,

sustainability, transitions and governance. I believe that researchers can use strategies as windows to see into current meta-regimes and that those strategies therefore are excellent vantage points for studying deep transitions. By carefully choosing and comprehensively analyzing selected strategies, it is possible to get insights of alignment and variation of worldviews in different localities. The three approaches for exploring strategies I chose to highlight in this thesis should not be understood as separate, but instead supportive of each other. Through combining them, I believe researcher can get both a comprehensive and detailed understanding of the situation.

The topics in this thesis are ambitious and require a lot of further research. However, the more work that is made on a subject; the stronger is the theoretical ground new research can stand on. Therefore, even if I do not come up with concrete answers regarding how far spread the architecture of the earth system governance is, nor if it has been able to shift the current deep transitions into a new direction, I feel that this thesis gives a valuable contribution to the understanding of the geographical aspects of transition studies. I highlight what requirements spatiality put on the framework for deep transitions and how it enhances the understanding of transition processes. I have also contributed to the discussion by combining literature and widening the concept of deep sustainability transition. System thinking is a key competence for understanding sustainability (Wiek et al., 2011). Instead of focusing on a specific socio-technological system, which is normal in transition studies, I treat sustainable development as a deep transition where rules across different dimensions of society are starting to align. These connections are essential in how our societies look and function in reality (Schot & Kanger, 2018). Lastly, I also gave a framework that I hope future studies can use to give insights on the connections between geography, transitions and governance.

As Perez (2007) says it is only by understanding the current situation, the process behind transitions and the tools available that we can make the present count and alternate how global governance should tackle the problems we are faced with. I hope this thesis at least to some extent answer these needs and that the steppingstones I have laid down here can be used in further research. Are we still in the first deep transition, that stems from the beginning of the industrial era (Schot & Kanger, 2018), or are Perez (2013) predictions of a greener future starting to become reality? What tomorrow brings is up to us, as “sustainable development is really only an idea; what matters is what people actually do with it” (Jordan, 2008, 25).

References

Abbott, K. W., & Snidal, D. (2000). Hard and soft law in international governance. *International Organization, 54*(3), 421-456.

Agnew, J. (1994). The territorial trap: The geographical assumptions of international relations theory. *Review of International Political Economy, 1*(1), 53-80.

Alasuutari, P. (2011). *Laadullinen tutkimus 2.0*. Tampere: Vastapaino.

Albareda-Tiana, S., Vidal-Raméntol, S., & Fernández-Morilla, M. (2018). Implementing the sustainable development goals at university level. *International Journal of Sustainability in Higher Education, 19*(3), 473-497.

Allen, J. (2003). *Lost geographies of power*. Oxford, UK: Blackwell.

Amin, A. (2002). Spatialities of globalisation. *Environment and Planning A: Economy and Space, 34*(3), 385-399.

Amin, A. (2004). Regions unbound: Towards a new politics of place. *Geografiska Annaler: Series B, Human Geography, 86*(1), 33-44.

Baker, S., & Eckerberg, K. (2007). Governance for sustainable development in sweden: The experience of the local investment programme. *Local Environment, 12*(4), 325-342.

Barnett, T. P. (2003). The pentagon's new map. *Esquire, 1*, 2003.

Barth, M., & Timm, J. (2011). Higher education for sustainable development: Students' perspectives on an innovative approach to educational change. *Journal of Social Science, 7*(1), 13-23.

Biermann, F., Abbott, K., Andresen, S., Bäckstrand, K., Bernstein, S., Betsill, M. M., . . . Folke, C. (2012). Transforming governance and institutions for global sustainability: Key insights from the earth system governance project. *Current Opinion in Environmental Sustainability, 4*(1), 51-60.

Biermann, F., Betsill, M., Gupta, J., Kani, N., Lebel, L., Liverman, D., . . . Siebenhüner, B. (2009). *Earth System Governance: People, Places and the Planet. Science and Implementation Plan of the Earth System Governance Project*. Bonn: IHDP.

Boutros-Ghali, B. (1991). Empowering the United Nations. *Foreign Affairs, 71*(5), 89-102.

Brenner, N. (2001). The limits to scale? Methodological reflections on scalar structuration. *Progress in Human Geography, 25*(4), 591-614.

Brenner, N. (2004). *New state spaces: Urban governance and the rescaling of statehood*. Oxford, UK: Oxford University Press.

Buijs, A. E., Mattijssen, T. J., Van der Jagt, Alexander PN, Ambrose-Oji, B., Andersson, E., Elands, B. H., & Steen Møller, M. (2016). Active citizenship for urban green infrastructure: fostering the diversity and dynamics of citizen contributions through mosaic governance. *Current Opinion in Environmental Sustainability, 22*, 1-6.

Campbell, S. (1999). Green cities, growing cities, just cities?: Urban planning and the contradictions of sustainable development. *Journal of the American Planning Association, 62*(3), 296-312.

Coe, N. M., Hess, M., Yeung, H. W., Dicken, P., & Henderson, J. (2004). 'Globalizing'regional development: A global production networks perspective. *Transactions of the Institute of British Geographers, 29*(4), 468-484.

Coenen, L., Benneworth, P., & Truffer, B. (2012). Toward a spatial perspective on sustainability transitions. *Research Policy, 41*(6), 968-979.

Coenen, L., & Truffer, B. (2012). Places and spaces of sustainability transitions: Geographical contributions to an emerging research and policy field. *European Planning Studies, 20*(3), 367-374.

Dahlmann, F., Stubbs, W., Griggs, D., & Morrell, K. (2019). Corporate actors, the UN sustainable development goals and earth system governance: A research agenda. *The Anthropocene Review, 6*(1-2), 167-176.

Drisko, J. W., & Maschi, T. (2015). *Content analysis*. Oxford, UK: Oxford University Press.

Ehnert, F., Kern, F., Borgström, S., Gorissen, L., Maschmeyer, S., & Egermann, M. (2018). Urban sustainability transitions in a context of multi-level governance: A comparison of four european states. *Environmental innovation and societal transitions*, 26, 101-116.

Farla, J., Markard, J., Raven, R., & Coenen, L. (2012). Sustainability transitions in the making: A closer look at actors, strategies and resources. *Technological Forecasting and Social Change, 79*(6), 991-998.

Feola, G. (2015). Societal transformation in response to global environmental change: A review of emerging concepts. *Ambio, 44*(5), 376-390.

Findler, F., Schönherr, N., Lozano, R., Reider, D., & Martinuzzi, A. (2019). The impacts of higher education institutions on sustainable development: A review and conceptualization. *International Journal of Sustainability in Higher Education, 20*(1), 23-38.

Finkelstein, L. S. (1995). What is global governance. *Global Governance, 1*(3), 367-372.

Fischer, F. (2000). *Citizens, experts, and the environment: The politics of local knowledge*. Durham, NC: Duke University Press.

Flyvbjerg, B. (2004). Phronetic planning research: Theoretical and methodological reflections. *Planning Theory & Practice, 5*(3), 283-306.

Freeman, R. (2012). Reverb: Policy making in wave form. *Environment and Planning A, 44*(1), 13-20.

Fuenfschilling, L., & Binz, C. (2018). Global socio-technical regimes. *Research Policy, 47*(4), 735-749.

Fuenfschilling, L., & Truffer, B. (2016). The interplay of institutions, actors and technologies in socio-technical systems—An analysis of transformations in the Australian urban water sector. *Technological Forecasting and Social Change, 103,* 298-312.

Gao, P. (2005). Using actor-network theory to analyse strategy formulation. *Information Systems Journal, 15*(3), 255-275.

Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. *Research Policy, 31*(8-9), 1257-1274.

Geels, F. W. (2004). From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. *Research Policy, 33*(6-7), 897-920.

Geels, F. W. (2005). *Technological transitions and system innovations: A co-evolutionary and socio-technical analysis*. Cheltenham, UK: Edward Elgar Publishing.

Geels, F. W. (2010). Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective. *Research Policy, 39*(4), 495-510.

Geels, F. W. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions, 1*(1), 24-40.

Graymore, M. L., Sipe, N. G., & Rickson, R. E. (2008). Regional sustainability: How useful are current tools of sustainability assessment at the regional scale? *Ecological Economics, 67*(3), 362-372.

Grin, J., Rotmans, J., & Schot, J. (2010). *Transitions to sustainable development: New directions in the study of long term transformative change.* New York: Routledge.

Grönfors, M. (2015). Havaintojen teko aineistonkeräyksen menetelmänä. In Valli, R., & Aaltola, J. (Ed.), *Ikkunoita tutkimusmetodeihin, Metodin valinta ja aineistonkeruu: virikkeitä aloittelevalle tutkijalle* (pp. 146-164). Jyväskylä, FIN: PS-Kustannus.

Hansen, T., & Coenen, L. (2015). The geography of sustainability transitions: Review, synthesis and reflections on an emergent research field. *Environmental innovation and societal transitions, 17,* 92-109.

Haughton, G., Allmendinger, P., & Oosterlynck, S. (2013). Spaces of neoliberal experimentation: Soft spaces, postpolitics, and neoliberal governmentality. *Environment and Planning A, 45*(1), 217-234.

Helsingin Kaupunki (2019). *Agendasta teoiksi YK:n kestävän kehityksen tavoitteiden toteutuminen Helsingissä 2019*. Kaupunginkanslia, Helsingin Kaupungin Keskushallinnon Julkaisuja 2019:24.

Hodson, M., & Marvin, S. (2010). Can cities shape socio-technical transitions and how would we know if they were? *Research Policy, 39*(4), 477-485.

Häikiö, L., & Leino, H. (2014). *Tulkinnan mahti: Johdatus tulkitsevaan politiikka-analyysiin*. Tampere: Vastapaino.

Hölscher, K., Wittmayer, J. M., & Loorbach, D. (2018). Transition versus transformation: What's the difference? *Environmental innovation and societal transitions, 27*, 1-3

Jessop, B., Brenner, N., & Jones, M. (2008). Theorizing sociospatial relations. *Environment and Planning D: Society and Space, 26*(3), 389-401.

Johnstone, P., & Newell, P. (2018). Sustainability transitions and the state. *Environmental innovation and societal transitions, 27*, 72-82.

Jonas, A. E., & Moisio, S. (2016). City regionalism as geopolitical processes: A new framework for analysis. *Progress in Human Geography, 42*(3), 350-370.

Jordan, A. (2008). The governance of sustainable development: Taking stock and looking forwards. *Environment and Planning C: Government and Policy, 26*(1), 17-33.

Kampelmann, S., Kaethler, M., & Hill, A. V. (2018). Curating complexity: An artful approach for real-world system transitions. *Environmental innovation and societal transitions, 27*, 59-71.

Kates, R. W., Parris, T. M., & Leiserowitz, A. A. (2005). What is sustainable development? goals, indicators, values, and practice. *Environment, 47*(3), 8-21.

Kates, R. W., Clark, W. C., Corell, R., Hall, J. M., Jaeger, C. C., Lowe, I., . . . Dickson, N. M. (2001). Sustainability science. *Science, 292*(5517), 641-642.

Klabbers, J. (1998). The undesirability of soft law. *Nordic Journal of International Law, 67*, 381-391.

Knights, D., & Morgan, G. (1991). Corporate strategy, organizations, and subjectivity: A critique. *Organization Studies, 12*(2), 251-273.

Knox, P. L., & Marston, S. A. (2015). *Human geography: Places and regions in global context, global edition*. New York: Pearson.

Komiyama, H., & Takeuchi, K. (2006). Sustainability science: Building a new discipline. *Sustainability Science, 1*, 1-6.

Korhonen, K., Koivuranta, R., Kuitto, V., Pietikäinen, J., Schönach, P., & Soini, K. (2020). Towards Realising SDGs in the University of Helsinki. In Godwell, N. & Vuyo M, (Ed.),

Sustainable Development Goals and Institutions of Higher Education (pp. 15-29). Cham, CH: Springer.

Lafferty, W. M., & Eckerberg, K. (2009). The Nature and purpose of 'Local Agenda 21'. In Lafferty, W. M., & Eckerberg, K. (Ed.), *From the earth summit to local agenda 21: Working towards sustainable development (pp. 1-17).* New York: Earthscan.

Leiserowitz, A. A., Kates, R. W., & Parris, T. M. (2005). Do global attitudes and behaviors support sustainable development? *Environment: Science and Policy for Sustainable Development, 47*(9), 22-38.

Leitner, H., Sheppard, E., & Sziarto, K. M. (2008). The spatialities of contentious politics. *Transactions of the Institute of British Geographers, 33*(2), 157-172.

Loorbach, D., & Rotmans, J. (2006). Managing transitions for sustainable development. In Olsthoorn, X., & Wieczorek, A. J. (Eds.), Understanding industrial transformation: views from different disciplines, vol. 44 (pp. 187-206). Dordrecht: Springer.

Lundqvist, L. J. (2004). *Sweden and ecological governance: Straddling the fence*. Manchester, UK: Manchester University Press.

Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy, 41*(6), 955-967.

Meadowcroft, J. (2011). Engaging with the politics of sustainability transitions. *Environmental Innovation and Societal Transitions, 1*(1), 70-75.

Moisio, S., Luukkonen, J., & Jonas, A. E. (2018). Political geographies of globalization. In Klooserman, R., Mamadouh, V., & Terhorst, P. (Ed.), *Handbook on the Geographies of Globalization* (pp. 135-149). Cheltenham, UK: Edward Elgar Publishing.

Morgan, A. D. (2009). Learning communities, cities and regions for sustainable development and global citizenship. *Local Environment, 14*(5), 443-459.

Moser, S., & Dilling, L. (2012). Communicating climate change: closing the science-action gap. In Dryzek, J. S., Norgaard, R. B., & Schlosberg, D. (Ed.), *The Oxford handbook of climate change and society* (pp. 161-174). Oxford, Uk: Oxford University Press.

Murphy, J. T. (2015). Human geography and socio-technical transition studies: Promising intersections. *Environmental Innovation and Societal Transitions, 17*, 73-91.

National Research Council (1999). Our Common Journey: A transition toward sustainability. *Ekistics, 66, 82-101.*

Nilsson, M., & Persson, Å. (2012). Can earth system interactions be governed? Governance functions for linking climate change mitigation with land use, freshwater and biodiversity protection. *Ecological Economics, 75*, 61-71.

Nunn, N. (2012). Culture and the historical process. *Economic History of Developing Regions, 27*(Supplement 1), 108-126.

Oesch, E. (1996). Hermeneutiikka–tietoteoriaa vai ymmärtämisen ontologiaa. *Niin & Näin, 3*(2), 14-17.

Paletta, A., & Bonoli, A. (2019). Governing the university in the perspective of the United Nations 2030 agenda: The case of the University of Bologna. *International Journal of Sustainability in Higher Education,* 20(3), 500-514.

Palonen, K. (1987). *Tekstistä politiikkaan: Johdatusta tulkintataitoon*. Jyväskylä, FIN: Jyväskylän yliopisto, Valtio-opin laitos.

Perez, C. (1983). Structural change and assimilation of new technologies in the economic and social systems. *Futures, 15*(5), 357-375.

Perez, C. (2003). *Technological revolutions and financial capital – The Dynamics of Bubbles and Golden Ages.* Cheltenham, UK: Edward Elgar Publishing.

Perez, C. (2007). Great surges of development and alternative forms of globalization. *Technology Governance and Economic Dynamics,* 32, Working Paper 15.

Perez, C. (2013). Unleashing a golden age after the financial collapse: Drawing lessons from history. *Environmental Innovation and Societal Transitions, 6*, 9-23.

Perez, C. (2015). Capitalism, Technology and a Green Global Golden Age: The Role of History in Helping to Shape the Future. *The Political Quarterly, 86*, 191-217.

Pierce, J., Martin, D. G., & Murphy, J. T. (2011). Relational place-making: The networked politics of place. *Transactions of the Institute of British Geographers, 36*(1), 54-70.

Prime Minister's Office (2016). *National report on the implementation of the 2030 agenda for sustainable development.* Prime Minister's Office Publications 10/2016, Retrieved from http://urn.fi/URN:ISBN:978-952-287-278-4

Prince, R. (2017). Local or global policy? Thinking about policy mobility with assemblage and topology. *Area, 49*(3), 335-341.

Qiu, J. (2016). The role of geography in sustainable development. *National Science Review, 4*(1), 140-143.

Rapoport, E. (2015). Globalising sustainable urbanism: The role of international masterplanners. *Area, 47*(2), 110-115.

Rip, A., & Kemp, R. (1998). Technological change. *Human Choice and Climate Change, 2*(2), 327-399.

Sahlins, M. (1994). Cosmologies of capitalism: The trans-pacific sector of 'The world system'. In Dirks, N. B., Eley, G., & Ortner, S. B. (Ed). *Culture/Power/History: A Reader in Contemporary Social Theory (pp.* 412-455). New Jersey, US: Princeton University Press.

Sassen, S. (2013). Expelled: Humans in capitalism s deepening crisis. *Journal of World-Systems Research, 19*(2), 198-201.

Schot, J., & Kanger, L. (2018). Deep transitions: Emergence, acceleration, stabilization and directionality. *Research Policy, 47*(6), 1045-1059.

Seyfang, G., & Smith, A. (2007). Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental Politics, 16*(4), 584-603.

Sibbel, A. (2009). Pathways towards sustainability through higher education. *International Journal of Sustainability in Higher Education, 10*(1), 68-82.

Skjærseth, J. B., Stokke, O. S., & Wettestad, J. (2006). Soft law, hard law, and effective implementation of international environmental norms. *Global Environmental Politics, 6*(3), 104-120.

Smith, A., Voß, J., & Grin, J. (2010). Innovation studies and sustainability transitions: The allure of the multi-level perspective and its challenges. *Research Policy, 39*(4), 435-448.

Sneddon, C., Howarth, R. B., & Norgaard, R. B. (2006). Sustainable development in a post-brundtland world. *Ecological Economics, 57*(2), 253-268.

Soini, K., Jurgilevich, A., Pietikäinen, J., & Korhonen-Kurki, K. (2018). Universities responding to the call for sustainability: A typology of sustainability centres. *Journal of Cleaner Production, 170,* 1423-1432.

Somin, I. (2018). Making federalism great again: How the trump administration's attack on sanctuary cities unintentionally strengthened judicial protection for state autonomy. *Texas Law Review, 97*(7), 1247-1294.

Sorrell, S. (2018). Explaining sociotechnical transitions: A critical realist perspective. *Research Policy, 47(7*), 1267-1282.

Späth, P., & Rohracher, H. (2010). 'Energy regions': The transformative power of regional discourses on socio-technical futures. *Research Policy, 39*(4), 449-458.

Trent, T. R., & Chavis, D. M. (2009). Scope, scale, and sustainability: What it takes to create lasting community change. *The Foundation Review, 1*(1), 96-114.

Truffer, B., Murphy, J. T., & Raven, R. (2015). The geography of sustainability transitions: Contours of an emerging theme. *Environmental Innovation and Societal Transitions, 17,* 63-72.

United Nations (2012). *Post-2015 Development Agenda: Guidelines for National Consultations, What future do you want?* New York: United Nations Development Group. Retrieved from https://undg.org/wp-content/uploads/2016/12/POST-2015-ENGLISH-July-08.pdf

United Nations (2015). *Transforming our world: The 2030 agenda for sustainable development. A/RES/70/1.* New York: UN General Assembly.

United Nations (2018). SDG poster without UN emblem. New York: United Nations Department for Global Communications. Retrieved from https://www.un.org/sustainabledevelopment/news/communications-material/

Valli, R., & Aaltola, J. (2015). *Ikkunoita tutkimusmetodeihin, Metodin valinta ja aineistonkeruu: virikkeitä aloittelevalle tutkijalle*. Jyväskylä, FIN: PS-Kustannus.

Ward, K., & Jonas, A. E. (2004). Competitive city-regionalism as a politics of space: A critical reinterpretation of the new regionalism. *Environment and Planning A, 36*(12), 2119-2139.

WCED, World Commission on Environment and Development (1987). *Our Common future, the world commission on environment and development.* Oxford, UK: Oxford University Press.

Whitmarsh, L. (2012). How useful is the multi-level perspective for transport and sustainability research? *Journal of Transport Geography, 24*, 483-487.

Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science, 6*(2), 203-218.

Willamo, R., Helenius, L., Holmström, C., Haapanen, L., Sandström, V., Huotari, E., . . . Happonen, J. (2018). Learning how to understand complexity and deal with sustainability challenges–A framework for a comprehensive approach and its application in university education. *Ecological Modelling, 370*, 1-13.

Wood, A. (2016). Tracing policy movements: Methods for studying learning and policy circulation. *Environment and Planning A, 48*(2), 391-406.